حمل الآن

مجانا وحصريا

امتحانات رقم (1)

الترم الاول





2025

1 Cairo Governorate

El-Nozha Directorate
Mathematics Supervision

First Multiple choice questions

Interactive tests (1)

Choose the correct answer from those given :

(1) The conjugate of the number : 3 i – 5 is .....

(a) 3 i + 5 (b) – (3 i + 5) (c) 5 – 3 i (d) – (5 – 3 i)

(2) The angle whose measure : – 120° lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(3) If the polygon M_1 is enlargement of polygon M_2 , and K is the scale factor , then .....

(a) K > 1 (b) K < 1 (c) K = 0 (d) 0 < K < 1

(4) All ..... are similar.

(a) triangles (b) rectangles

(c) squares (d) parallelograms

(5) If $\mathcal{X} = 2$, is one root of the equation : $\mathcal{X}^2 - k\,\mathcal{X} - 6 = 0$, then k = ...

(a) 1 (b) – 1 (c) 2 (d) zero

(6) If the length of the radius of the circle M is 9 cm. , AM = 12 cm. , then $P_M(A)$ = ...

(a) 144 (b) 81 (c) 63 (d) 225

(7) The solution set of the inequality : $\mathcal{X}^2 + 3\,\mathcal{X} - 4 \geq 0$ in $\mathbb{R}$ is .....

(a) $\{-4 , 1\}$ (b) $[-4 , 1]$

(c) $\mathbb{R} -]-4 , 1[$ (d) $\mathbb{R} - [-4 , 1]$

(8) **In the opposite figure :**

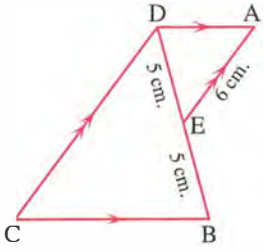
DC = ... cm.

(a) 6

(b) 9

(c) 12

(d) 15



(9) The quadratic equation whose roots are $\frac{3}{2}$ i , $\frac{3}{2}$ i^3 is .....

(a) $4\,\mathcal{X}^2 - 9 = 0$ (b) $4\,\mathcal{X}^2 + 9 = 0$

(c) $9\,\mathcal{X}^2 - 4 = 0$ (d) $9\,\mathcal{X}^2 + 4 = 0$

(10) The length of the arc in a circle , its radius length is 6 cm. , and its central angle of measure 60° , equals ..... cm.

(a) 5π (b) 4π (c) 3π (d) 2π

(11) The internal bisector of vertex angle of a triangle is ..... the external bisector of it.

(a) parallel to (b) equal to

(c) perpendicular to (d) coincident with

(12) Which measure of the following angles whose sine and cosine are negative together ?

(a) 30° (b) 120° (c) 220° (d) 320°

(13) If two similar polygons , the ratio between their perimeters = 4 : 9 , then the ratio between their areas = ...

(a) 4 : 9 (b) 9 : 4 (c) 2 : 3 (d) 16 : 81

(14) If $\sin(2x + 15°) = \cos(3x + 25°)$, where $x \in]0 , \frac{\pi}{4}[$, then the value of x = ...

(a) 10° (b) 50° (c) 25° (d) 30°

(15) If the product of roots of the equation : $x^2 - 3x + k = 0$ is 1 , then k = ...

(a) – 2 (b) – 1 (c) 1 (d) 2

(16) In the opposite figure :

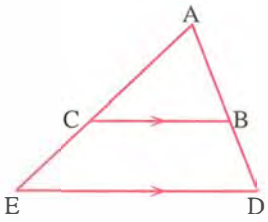
If $\overline{BC} // \overline{DE}$, then .....

(a) BCED is cyclic quadrilateral.

(b) $\Delta ABC \sim \Delta ADE$

(c) $AB \times AD = AC \times AE$

(d) AB : BD = BC : DE

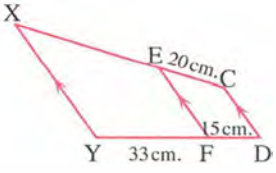


(17) In the opposite figure :

Length of $\overline{XC}$ = ... cm.

(a) 48 (b) 64

(c) 44 (d) 21



(18) $\tan x + \tan(180° - x)$ = ...

(a) 0 (b) 1 (c) – 1 (d) $2 \tan x$

(19) If two similar rectangles , their widths are 6 cm. , 3 cm. respectively , then the ratio between their perimeters = ... respectively.

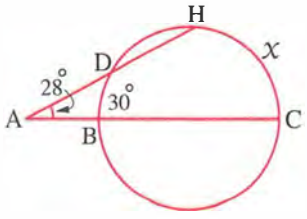
(a) 2 : 3 (b) 3 : 2 (c) 1 : 2 (d) 2 : 1

(20) If the roots of the equation : $x^2 + 4x + k = 0$, are different and real , then k ∈ .....

(a) $]-\infty , 4[$ (b) $]4 , \infty[$ (c) $]-\infty , 4]$ (d) $\{4\}$

(21) In the opposite figure :

$\mathcal{X}$ = ...



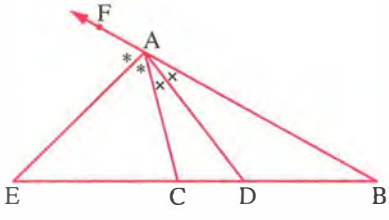
(a) 30° (b) 60°

(c) 86° (d) 26°

(22) If $2 + 3i + (1 - i) = \mathcal{X} + iy$, then $\mathcal{X} + y$ = ...

(a) 2 (b) – 4 (c) 5 (d) 7

(23) Using the opposite figure :



The false statement of the following is .....

(a) $\frac{BA}{AC} = \frac{BD}{DC}$ (b) $\frac{BA}{AC} = \frac{BE}{EC}$

(c) $\frac{CA}{AB} = \frac{DA}{AE}$ (d) ∠ DAE is right.

(24) The sign of the function $f(\mathcal{X}) = \mathcal{X} - 2$ is negative if .....

(a) $\mathcal{X} > 2$ (b) $\mathcal{X} \geq 2$ (c) $\mathcal{X} \leq 2$ (d) $\mathcal{X} < 2$

(25) If $13 \sin(90° - \theta) = 5$, then $\cos\theta$ = ...

(a) $\frac{12}{13}$ (b) $\frac{5}{13}$ (c) $-\frac{12}{13}$ (d) $-\frac{5}{13}$

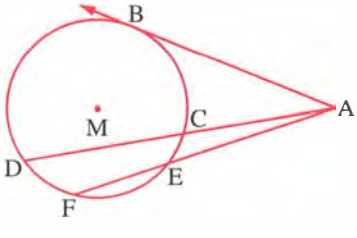
(26) The triangle in which two angles of measures 60° , 75° is similar to the triangle in which two angles of measures 45° , ...

(a) 30° (b) 55° (c) 75° (d) 100°

(27) In the opposite figure :

If $\overrightarrow{AB}$ is a tangent to the circle M

, then $(AB)^2$ = ...



(a) AC × CD (b) AE × EF

(c) $P_M(A)$ (d) $\frac{AC}{AD}$

Second Essay questions

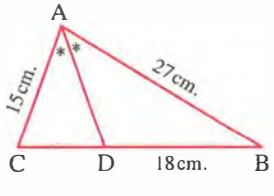
Answer the following questions :

1 Find the solution set in $\mathbb{R}$ for the inequality : $\mathcal{X}^2 + 5\mathcal{X} - 6 \geq 0$

2 In the opposite figure :

$\overrightarrow{AD}$ bisects ∠ BAC

Calculate the length of : $\overline{AD}$



2 Cairo Governorate

El-Zaitoun Directorate
Mathematics Supervision

First Multiple choice questions

Interactive tests ②

Choose the correct answer from those given :

(1) Number of roots of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) 2 (b) 1 (c) 3 (d) zero

(2) If $\Delta ABC \sim \Delta DEF$, $BC = 3\ EF$, then the scale factor of similarity of the two triangles = ...

(a) $\frac{2}{3}$ (b) $\frac{1}{2}$ (c) 1 (d) 3

(3) The angle of measure 585° in standard position is equivalent to the angle of measure .....

(a) 45° (b) 135° (c) 225° (d) 315°

(4) The simplest form of imaginary number i^{45} is .....

(a) – 1 (b) 1 (c) – i (d) i

(5) Two angles of a triangle with measures 50° , 70° similar to another triangle with angles of measures 50° and .....°

(a) 60 (b) 80 (c) 55 (d) 40

(6) The ratio between two corresponding sides of two similar squares is 3 : 4 , if the area of the greater square is 48 cm^2 , then the area of smaller one = ... cm^2

(a) 16 (b) 12 (c) 20 (d) 27

(7) The conjugate of the number (– 8) is .....

(a) 8 i (b) – 8 i (c) – 8 (d) 8

(8) If the two roots of the equation : $3x^2 - 6x + k = 0$ are equal real , then k = ...

(a) 2 (b) 3 (c) 6 (d) 9

(9) If M is a circle of radius length 3 cm. , A is a point lies in its plane where MA = 4 cm. , then $P_M(A)$ = ...

(a) $\sqrt{7}$ (b) 9 (c) 7 (d) – 7

(10) The angle of measure $\frac{9\pi}{4}$ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(11) Two similar polygons , the length of two corresponding sides are 7 cm. , 11 cm. , then the ratio between their two perimeters is .....

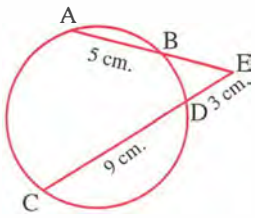
(a) $\frac{49}{121}$ (b) $\frac{7}{18}$ (c) $\frac{7}{11}$ (d) $\frac{11}{18}$

(12) If $\cos\theta = \frac{1}{2}$, $\sin\theta = \frac{\sqrt{3}}{2}$, then the measure of angle θ = ...

(a) $\frac{\pi}{3}$ (b) $\frac{5\pi}{6}$ (c) $\frac{5\pi}{3}$ (d) $\frac{11\pi}{6}$

(13) In the opposite figure :

BE = ... cm.



(a) 6 (b) 5

(c) 4 (d) 3

(14) The sum of the two roots of the equation : $5x^2 - 3 = 0$ is .....

(a) $\frac{3}{5}$ (b) $\frac{-3}{5}$ (c) zero (d) $\frac{5}{3}$

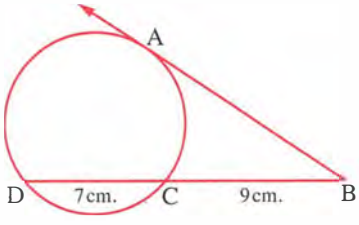
(15) If one of the two roots of the equation : $3x^2 - (b-3)x + 5 = 0$ is the additive inverse of the other , then b = ... cm.

(a) – 5 (b) – 3 (c) 3 (d) 5

(16) In the opposite figure :

$\overrightarrow{BA}$ is a tangent , BC = 9 cm. , CD = 7 cm.

, then AB = ... cm.



(a) 63 (b) 144

(c) 12 (d) $\frac{9}{16}$

(17) If M is a circle , A is a point lies in its plane where $P_M(A) = 0$, then A lies .....

(a) inside the circle. (b) on the centre of the circle.

(c) outside the circle. (d) on the circle.

(18) If x is the measure of one angle in right-angled triangle , $\sin x = \frac{4}{5}$

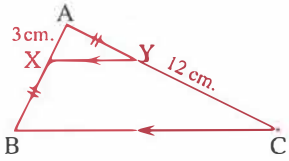
, then $\cos(90° - x)$ = ...

(a) $\frac{3}{5}$ (b) $-\frac{3}{5}$ (c) $-\frac{4}{5}$ (d) $\frac{4}{5}$

(19) In the opposite figure :

If $\overline{XY} \parallel \overline{BC}$

, then AC = ... cm.



(a) 15 (b) 16

(c) 18 (d) 20

(20) The two similar polygons are congruent if the scale factor K satisfies .....

(a) $K = \frac{1}{2}$ (b) $K = 1$ (c) $K > 1$ (d) $0 < K < 1$

(21) The quadratic equation whose roots are – 2 i and 2 i is .....

(a) $x^2 = 4i$ (b) $x^2 + 4 = 0$

(c) $x^2 - 4 = 0$ (d) $i\,x^2 + 4 = 0$

(22) If L , M are the two roots of the equation : $x^2 - 7x + 3 = 0$, then the value of the expression : $L^2 M + L M^2 =$ .....

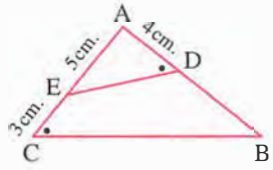
(a) 7 (b) 3 (c) 10 (d) 21

(23) Two similar polygons , the ratio between their perimeters equal 4 : 9 , then the ratio between the lengths of two corresponding sides is .....

(a) 4 : 9 (b) 2 : 3 (c) 16 : 81 (d) 9 : 4

(24) In the opposite figure :

BD = ... cm.



(a) 5 (b) 6

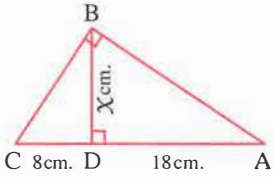
(c) 4 (d) 7

(25) If XYZL is a cyclic quadrilateral , $\cos X = \frac{1}{2}$, then $\sin(270° - Z) =$ .....

(a) $\frac{\sqrt{3}}{2}$ (b) $-\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

(26) In the opposite figure :

x = ... cm.



(a) $12\sqrt{3}$ (b) 24

(c) 12 (d) $8\sqrt{3}$

(27) The S.S. of the inequality $(x - 1)^2 \leq 0$ in $\mathbb{R}$ is .....

(a) $\mathbb{R}$ (b) $\varnothing$ (c) $\{1\}$ (d) $\mathbb{R} - \{1\}$

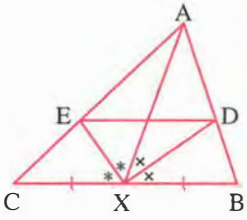
Second Essay questions

Answer the following questions :

1 Determine the sign of the function , then represent your answer on number line :

$f(x) = x^2 + 2x - 3$

2 **In the opposite figure :**



ABC is a triangle X is midpoint of $\overline{BC}$

, $\overrightarrow{XE}$ bisect $\angle AXC$

, $\overrightarrow{XD}$ bisect $\angle AXB$

Prove that : $\overline{ED} \parallel \overline{CB}$

3 **Cairo Governorate** — Khalifa and Mokattam Zone, Badr Language School

First Multiple choice questions

Interactive tests ③

Choose the correct answer from those given :

(1) If $4 \cos \theta = 3$ where θ is an acute angle , then $\tan(-\theta) =$ .....

(a) $\frac{3}{4}$ (b) $\frac{-\sqrt{7}}{4}$ (c) $\frac{-3}{4}$ (d) $\frac{-\sqrt{7}}{3}$

(2) The length of the arc of a circle its diameter length 24 cm. and opposite to a central angle its measure 60° is .....

(a) 2π (b) 3π (c) 4π (d) 8π

(3) If the two roots of the equation : $x^2 - 4x + k - 2 = 0$ are equal , then k = ...

(a) 5 (b) 6 (c) 4 (d) 8

(4) The conjugate of the number $3i + 5$ is .....

(a) $3i + 5$ (b) $3i - 5$ (c) $-3i - 5$ (d) $5 - 3i$

(5) The solution set of : $5 - 4x \geq x^2$ in $\mathbb{R}$ is .....

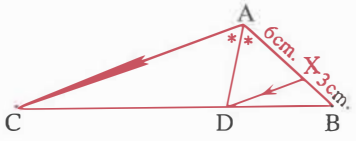
(a) $[-5 , 1]$ (b) $]-5 , 1[$

(c) $\mathbb{R} -]-5 , 1[$ (d) $\mathbb{R} - [-5 , 1]$

(6) **In the opposite figure :**

$\overrightarrow{AD}$ bisects $\angle A$, $\overline{DX} // \overline{AC}$

, then AC = ... cm.



(a) 12 (b) 18

(c) 8 (d) 15

(7) If $\tan(3\theta - 70°) \times \tan\theta = 1$ where $\theta \in]0 , \frac{\pi}{3}[$, then $\sin(2\theta + 10) =$ .....

(a) 1 (b) – 1 (c) zero (d) $\varnothing$

(8) If L is one of the two roots of the equation : $x^2 - 3x + 1 =$ zero

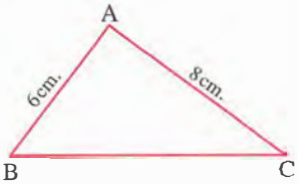
, then $3L - L^2 + 5 =$ .....

(a) 1 (b) 6 (c) 4 (d) – 6

(9) **In the opposite figure :**

$m(\angle A) = 2\, m(\angle B)$

, then BC = ... cm.



(a) $3\sqrt{3}$ (b) $2\sqrt{21}$

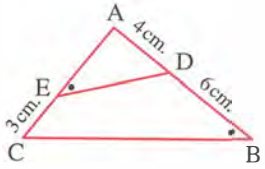
(c) $4\sqrt{7}$ (d) 10

(10) In the opposite figure :

m (∠ AED) = m (∠ B) , AD = 4 cm.

, DB = 6 cm. , CE = 3 cm.

, then AE = ... cm.



(a) 3 (b) 4 (c) 5 (d) 6

(11) The sign of function $f(x) = 8 - 2x$ is positive when .....

(a) $x > 4$ (b) $x < 4$ (c) $x \geq 4$ (d) $x \leq 4$

(12) Two similar triangles , the area of the first 50 cm^2 , the area of the second 32 cm^2 and the perimeter of the smaller is 16 cm. , then the perimeter of the greater = ... cm.

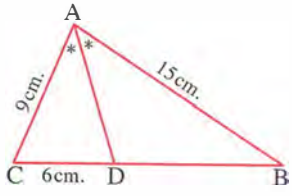
(a) 25 (b) 30 (c) 15 (d) 20

(13) In the opposite figure :

AB = 15 cm. , AC = 9 cm. , DC = 6 cm.

and $\overrightarrow{AD}$ bisect (∠ BAC)

, then AD = ... cm.



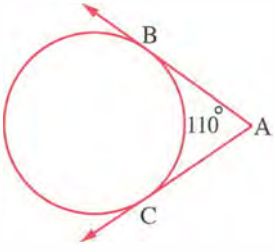
(a) $5\sqrt{5}$ (b) $3\sqrt{5}$ (c) 13.5 (d) $5\sqrt{3}$

(14) In the opposite figure :

$\overrightarrow{AB}$, $\overrightarrow{AC}$ are two tangents of the circle

, m $(\overset{\frown}{BC})$ = 110°

, then m (∠ A) = ...



(a) 70° (b) 55°

(c) 60° (d) 75°

(15) M is circle its radius length is 3 cm. , A is a point outside it where AM = 4 cm.

, then P_M (A) = ...

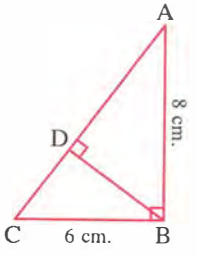
(a) 5 (b) 7 (c) 25 (d) 1

(16) In the opposite figure :

Δ ABC is right-angled triangle at B

, $\overline{BD} \perp \overline{AC}$

, then AD = ... cm.



(a) 5 (b) 3.6

(c) 6.4 (d) $5\frac{5}{7}$

(17) If Δ ABC ~ Δ XYZ , m (∠ A) = 60° , m (∠ Y) = 70° , then m (∠ C) = ...°

(a) 120 (b) 50 (c) 70 (d) 110

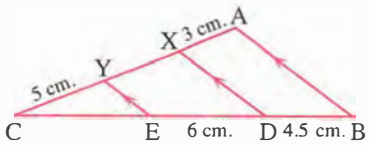
(18) $\tan(135°)\sec(240°) =$ ..... in simplest form.

(a) $\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) -2 (d) 2

(19) In the opposite figure :

$\overline{AB} // \overline{XD} // \overline{YE}$

, then XY + EC = ... cm.



(a) 11.5 (b) 10

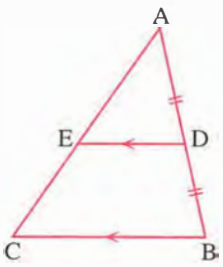
(c) 11 (d) 12

(20) In the opposite figure :

If D is the midpoint of $\overline{AB}$

, area of $\Delta ADE = 16\ cm^2$

, then the area of ΔABC = ... cm^2



(a) 32 (b) 48

(c) 64 (d) 50

(21) The maximum value of the function : $f(x) = 1 - 3\cos 2x$ is .....

(a) 3 (b) – 2 (c) 4 (d) 2

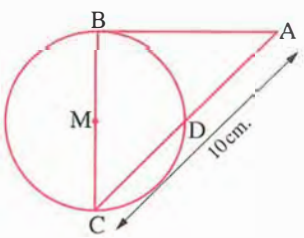
(22) In the opposite figure :

$\overline{AB}$ is a tangent of the circle at B

, $\overline{BC}$ is the diameter , BC = 8 cm.

, AC = 10 cm.

, then the length of $\overline{AD}$ = ... cm.



(a) 3.6 (b) 6.4 (c) 4.8 (d) 5

(23) The equation which its two roots are : $1 + i$, $1 + i^3$, where $i^2 = -1$ is .....

(a) $x^2 + 2x + 2 = 0$ (b) $x^2 - 2x + 2 = 0$

(c) $x^2 + 2x - 2 = 0$ (d) $x^2 - 2x - 2 = 0$

(24) If $\frac{2}{L}$, $\frac{2}{M}$ are the two roots of the equation : $4x^2 - 3x - 2 = 0$, then L + M = ...

(a) – 3 (b) 3 (c) – 8 (d) $\frac{-3}{4}$

(25) The simplest form of $\sin(270° - \theta) + \cos(360° - \theta)$ = ...

(a) $2\cos\theta$ (b) $-2\cos\theta$ (c) – 1 (d) zero

(26) The angle which its measure is $\frac{-8\pi}{3}$ lies in the ..... quadrant.

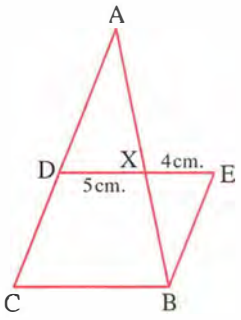
(a) first (b) second (c) third (d) fourth

(27) In the opposite figure :

EBCD is a rhombus such that :

EX = 4 cm. , XD = 5 cm.

, then the length of $\overline{AD}$ = ... cm.



(a) 9 (b) 10.5

(c) 11.25 (d) 14

Second Essay questions

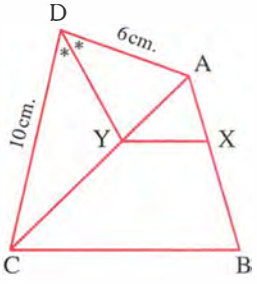
Answer the following questions :

1 In the opposite figure :

$\overrightarrow{DY}$ bisects ∠ ADC

and AX : XB = 3 : 5

Prove that : $\overline{XY}$ // $\overline{BC}$



2 Determine the sign of the function $f(x) = x^2 - 10x + 21$, then find in $\mathbb{R}$ the solution set of the inequality $f(x) <$ zero

4 Giza Governorate

Awsseem Educational Directorate
Mathematics Inspection

First Multiple choice questions

Interactive tests ④

Choose the correct answer from those given :

(1) If $x = 2 - 3i$, $y = -1 + 3i$, then the value of the expression :
$x^2 + 2xy + y^2$ = ...

(a) 9 (b) – 1 (c) 1 (d) 5

(2) If the two roots of the equation : $x^2 - 4x + 3 + \frac{1}{m} = 0$ are equal , then m = ...

(a) 3 (b) 1 (c) 4 (d) $\frac{4}{3}$

(3) If one root of the equation : $(x - k)^2 - 6x = 0$ is the additive inverse of the other , then k = ...

(a) – 3 (b) 6 (c) – 6 (d) 9

(4) If L is one root of the equation : $x^2 - 3x + 5 = 0$, then the value of the expression :
$2L^2 - 6L + 15$ = ...

(a) 3 (b) 5 (c) 15 (d) 10

(5) If L , M are the two roots of the equation : $(\mathcal{X} - a)(\mathcal{X} - b) = k$, then the equation whose roots are a , b is .....

(a) $(\mathcal{X} - L)(\mathcal{X} - M) = 0$
(b) $(\mathcal{X} - L)(\mathcal{X} - M) + k = 0$
(c) $\mathcal{X}^2 - (L + M)\mathcal{X} + k = 0$
(d) $(\mathcal{X} - L)(\mathcal{X} - M) = k$

(6) If the S.S. of the inequality : $\mathcal{X}^2 - 4 \leq \mathcal{X} + k$ is $[-2 , 3]$, then k = ...

(a) – 6 (b) 1 (c) 2 (d) 10

(7) If $f(\mathcal{X}) = \mathcal{X} - 2$, $g(\mathcal{X}) = \mathcal{X}^2 - 5\mathcal{X} - 6$, then the two functions are positive together at the same time in the interval .....

(a) $]6 , \infty[$ (b) $]2 , 6[$ (c) $]-2 , -\infty[$ (d) $[2 , 6]$

(8) If L , M are the two roots of the equation : $\mathcal{X}^2 - 5\mathcal{X} + 7 = 0$, then the value of the expression : $L^2 M + LM^2$ = ...

(a) 25 (b) 12 (c) 35 (d) 40

(9) The radian and degree measure of the central angle opposite to an arc of length 3 cm. in a circle of surface area 16π cm^2 equals .....

(a) 1^{rad} and 180°
(b) 1.5^{rad} and 86°
(c) 0.75^{rad} and 90°
(d) 0.75^{rad} and 42° 58̂

(10) If $(10\mathcal{X} - 15)°$ is the smallest positive measure , $(10 y - 15)°$ is the greatest negative measure of two equivalent angles , then $\mathcal{X} - y$ = ...

(a) 36 (b) 120 (c) 90 (d) 60

(11) If $10 \sin\theta = 6$ where θ is the measure of the greatest positive angle , then the numerical value of the expression : $\sec(540° + \theta)$ = ...

(a) $\frac{3}{5}$ (b) $\frac{-5}{4}$ (c) $\frac{5}{4}$ (d) $\frac{-3}{5}$

(12) If $\tan(180° + 5\theta) + \tan(270° + 4\theta) = 0$, then one value of θ which satisfy the equation where $\theta \in]0 , 90°[$ equals .....°

(a) 5 (b) 10 (c) 20 (d) 90

(13) If $f(\theta) = 2 \sin 4\theta$ is a periodic function and its period equals .....

(a) 2π (b) π (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{4}$

(14) If $\sin\theta = \frac{4}{5}$ where θ is the greatest positive angle , then the value of the expression : $\sin(180° - \theta) + \tan(360° - \theta) + 2\sin(270° - \theta)$ = ...

(a) $\frac{41}{15}$ (b) $\frac{13}{5}$ (c) $\frac{10}{3}$ (d) 15

(15) The ratio between the lengths of two corresponding sides in two similar polygons is 2 : 3 if the perimeter of the smaller is 14 cm. , then the perimeter of the greater = ... cm.

(a) 14 (b) 15 (c) 21 (d) 28

(16) A is a point in the plane of circle M , MA = 6 cm. , $P_M(A) = -13$, then the surface area of the circle = ... cm^2 , $\left(\text{where } \pi = \frac{22}{7}\right)$

(a) 7 (b) 44 (c) 154 (d) 144

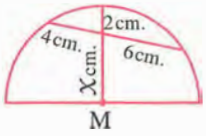
(17) The sum of areas of two similar polygons is 250 cm^2 and the ratio between their perimeters is 4 : 3 , then the surface area of the greater polygon =..... cm^2

(a) 160 (b) 144 (c) 150 (d) 155

(18) In the opposite figure :

A semicircle of centre M

, then $\mathcal{X}$ = ... cm.

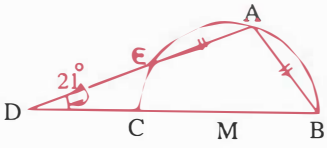


(a) 5 (b) 7 (c) 8 (d) 12

(19) In the opposite figure :

If AE = AB , $\overline{BC}$ is a diameter , m (∠ D) = 21°

, then m (∠ A) = ...



(a) 100° (b) 104° (c) 106° (d) 110°

(20) Δ ABC ~ Δ DEF , area of (Δ ABC) = 4 area of (Δ DEF) and if DE = 6 cm.

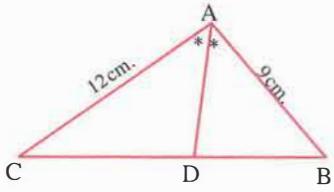
, then AB = ...

(a) 3 (b) 24 (c) 12 (d) 8

(21) In the opposite figure :

$\overrightarrow{AD}$ bisects ∠ BAC

, then $\frac{\text{area of } (\Delta ABD)}{\text{area of of } (\Delta ADC)}$ = ...



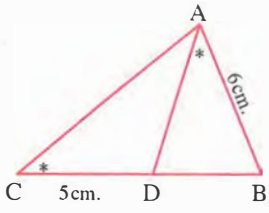
(a) 3 : 7 (b) 3 : 4

(c) 81 : 144 (d) 9 : 49

(22) In the opposite figure :

m (∠ BAD) = m (∠ C)

, then BD = ... cm.



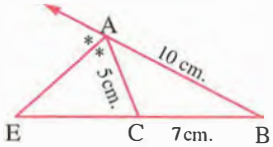
(a) 3 (b) 5

(c) 4 (d) 6

(23) In the opposite figure :

$\overrightarrow{AE}$ bisects the exterior angle at A

, then BE = ... cm.



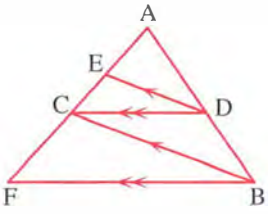
(a) 7 (b) 14

(c) 8 (d) 21

(24) In the opposite figure :

$\overline{DE} // \overline{BC}$, $\overline{DC} // \overline{BF}$

, then $AE \times AF =$ .....



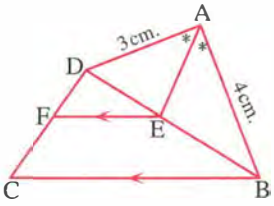
(a) $AD \times AB$ (b) $(AC)^2$

(c) $(AE)^2$ (d) $AC \times AB$

(25) In the opposite figure :

$\overrightarrow{AE}$ bisects $\angle BAD$, $\overline{FE} // \overline{CB}$

, then $\frac{DF}{FC} =$ .....



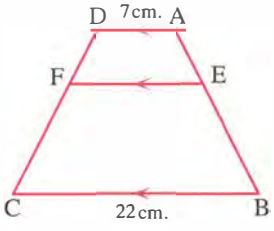
(a) $\frac{4}{3}$ (b) $\frac{3}{4}$

(c) $\frac{9}{16}$ (d) $\frac{16}{9}$

(26) In the opposite figure :

$\overline{AD} // \overline{EF} // \overline{BC}$, $\frac{AE}{EB} = \frac{2}{3}$

, then EF = ... cm.



(a) 9 (b) 11

(c) 13 (d) 15

(27) The interior and exterior bisectors at a vertex of an angle of a triangle are .....

(a) parallel. (b) bisect each other. (c) perpendicular. (d) congurent.

Second Essay questions

Answer the following questions :

1 If $L - 3$, $M - 3$ are the two roots of the equation : $x^2 - 7x - 10 = 0$

, then form the equation whose roots are : $\frac{1}{L}$, $\frac{1}{M}$

2 ABC is a triangle in which $AB > AC$, $D \in \overline{AB}$ such that : $BD = AC$, $\overrightarrow{AE}$ is drawn to bisect $\angle BAC$ to cut $\overline{DC}$ at E , then $\overrightarrow{EF} // \overline{BA}$ to cut $\overline{AC}$ at F

Prove that : $\overline{DF} // \overline{BC}$

5 Giza Governorate — Mathematics Inspection

First Multiple choice questions

Interactive tests ⑤

Choose the correct answer from those given :

(1) The angle in the standard position whose measure is – 285° lie in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(2) The range of the function $f(x) = 2 \cos 3x$ equals .....

(a) $[-2, 2]$ (b) $[-3, 3]$ (c) $[0, 2]$ (d) $[-2, 0]$

(3) The simplest form of the expression : $\cos(180° + \theta) + \sin(90° + \theta) =$ .....

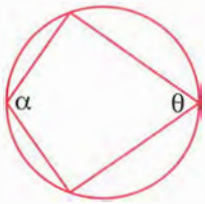
(a) 0 (b) 2 (c) $2 \cos\theta$ (d) $2 \sin\theta$

(4) If $\sin(\theta + 13) = \cos(\theta + 17)$, where θ is positive acute angle , then $\tan\theta =$ .....

(a) $\sqrt{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

(5) **In the opposite figure :**

If $5 \cos\theta = 3$, then $\tan\alpha =$ .....



(a) $\frac{3}{4}$ (b) $-\frac{3}{4}$

(c) $\frac{3}{5}$ (d) $\frac{-4}{3}$

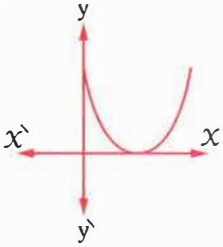
(6) If the terminal side of a positive angle in standard position intersects the unit circle at the point $\left(\frac{\sqrt{3}}{2}, y\right)$, where $0 < \theta < 90°$, then $\cot\theta =$ .....

(a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) $2\sqrt{3}$ (d) $\frac{-1}{\sqrt{3}}$

(7) If $L, \frac{4}{L}$ are the two roots of the equation : $x^2 + 7x + k = 0$, then $k =$ .....

(a) 4 (b) 7 (c) – 7 (d) 6

(8) The opposite figure represents the curve of the function $f(x) = a x^2 + 2x + c$, then $a c =$ .....



(a) – 1 (b) – 4

(c) 4 (d) 1

(9) If the two roots of the equation : $m x^2 - 12x + 9 = 0$ are equal then $m =$ .....

(a) 9 (b) 4 (c) 16 (d) 2

(10) The sign of the function $f(x) = 4 - 2x$ is not negative in the interval .....

(a) $[2, \infty[$ (b) $]2, \infty[$ (c) $]-\infty, 2[$ (d) $]-\infty, 2]$

(11) $(12\,i^{20} - 5\,i^{33}) - \left(7 - \sqrt{-81}\right) =$ .....

(a) $5 - 4\,i$ (b) $5 + 4\,i$ (c) $-5 + 4\,i$ (d) $-5 - 4\,i$

(12) If a , b , c , d four consecutive positive integers , then $i^a + i^b + i^c + i^d =$ .....

(a) zero (b) -1 (c) 1 (d) i

(13) If one of the two roots of the equation : $3x^2 + (a+3)x + 7 = 0$ is the additive inverse of the other , then a = ...

(a) -3 (b) 3 (c) $\frac{1}{3}$ (d) $\frac{-1}{3}$

(14) The solution set of the inequality : $-x(x+2) \geq 0$ in $\mathbb{R}$ is .....

(a) $[-2, 0]$ (b) $]-2, 0[$ (c) $\{-2, 0\}$ (d) $[-2, 2]$

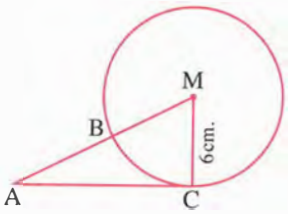
(15) In the opposite figure :

$\overline{AC}$ is tangent to circle M

, MC = 6 cm.

, $P_M(A) = 64$

, then AB = ... cm.



(a) 3 (b) 4 (c) 5 (d) 6

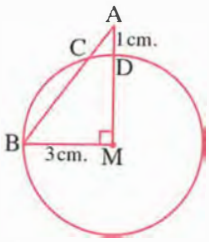
(16) In the opposite figure :

$\overline{MA} \perp \overline{MB}$ in circle M

its radius length = 3 cm.

, AM = 1 cm.

, then BC = ... cm.

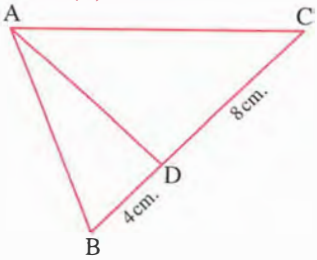


(a) 3.6 (b) 1.4 (c) 5 (d) 3

(17) In the opposite figure :

If m (∠ B) = 2 m (∠ DAB) = 2 m (∠ DAC)

, then AB = ... cm.



(a) 4 (b) 6

(c) 8 (d) 9

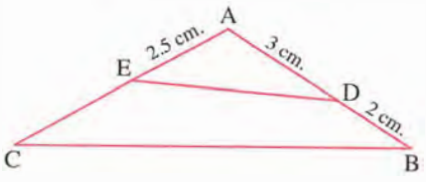
(18) If $\Delta ABC \sim \Delta DEF$, BC = 3 EF , then the factor of similarity of ΔABC to ΔDEF equals .....

(a) 3 (b) 1 (c) $\frac{1}{3}$ (d) $\frac{2}{3}$

(19) In the opposite figure :

$\Delta ABC \sim \Delta AED$

, then EC = ... cm.

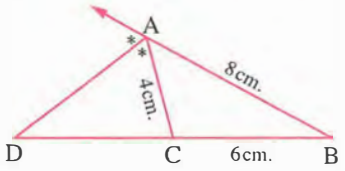


(a) 2.5 (b) 3

(c) 3.5 (d) 4.5

(20) In the opposite figure :

CD = ... cm.



(a) 2 (b) 4

(c) 6 (d) 8

(21) Any two regular polygons of the same number of sides are .....

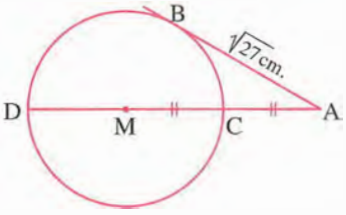
(a) congruent. (b) equal in area.

(c) equal in perimeter. (d) similar.

(22) In the opposite figure :

MC = CA , the radius length

of the circle M = ... cm.

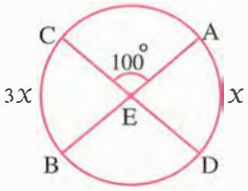


(a) 2 (b) 3

(c) 4 (d) 5

(23) In the opposite figure :

The value of $\mathcal{X}$ = ...

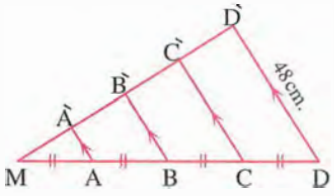


(a) 10° (b) 20°

(c) 30° (d) 40°

(24) In the opposite figure :

If $D\grave{D}$ = 48 cm. , then $B\grave{B}$ = ... cm.



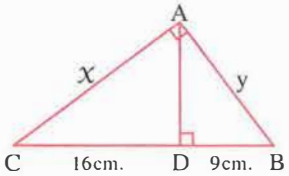
(a) 36 (b) 24

(c) 16 (d) 12

(25) In the opposite figure :

m (∠ BAC) = 90° , $\overline{AD} \perp \overline{BC}$

, then $\frac{y}{x}$ = ...



(a) 1 (b) $\frac{4}{3}$

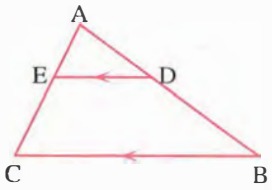
(c) $\frac{3}{4}$ (d) 2

(26) In the opposite figure :

$\overline{DE}$ // $\overline{BC}$ where $\frac{AD}{DB} = \frac{2}{3}$

and if the area of the trapezium DBCE = 105 cm^2

, then the area of triangle ADE = ... cm^2



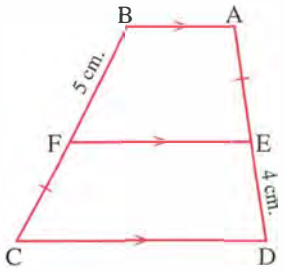
(a) 20 (b) 64 (c) 84 (d) 70

(27) In the opposite figure :

$\overline{AB} // \overline{FE} // \overline{CD}$, AE = FC

, BF = 5 cm. , ED = 4 cm.

, then AE = ... cm.



(a) 2 (b) $5\sqrt{2}$

(c) $2\sqrt{5}$ (d) 20

Second Essay questions

Answer the following questions :

1 If $\frac{4}{L}$, $\frac{4}{M}$ are the two roots of the equation : $x^2 - 5x + 2 = 0$

, then find the quadratic equation whose roots are L , M

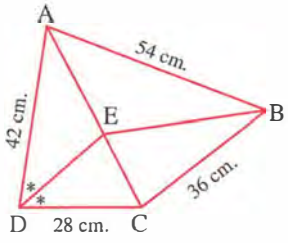
2 In the opposite figure :

$\overrightarrow{DE}$ bisects ∠ ADC , DA = 42 cm.

, DC = 28 cm. , BC = 36 cm.

, AB = 54 cm.

Prove that : $\overrightarrow{BE}$ bisects ∠ ABC



6 Alexandria Governorate

Al Agamy Zone
Math Inspection

First Multiple choice questions

Interactive tests (6)

Choose the correct answer from those given :

(1) The maximum value of the function $f(x) = \cos x$ equals 1 and happens when θ = ...

(a) π (b) 2 n π (c) π + 2 n π (d) π + n π

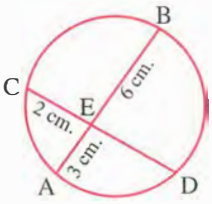
(2) The solution set of the inequality : $-x(x+3) \geq 0$ in $\mathbb{R}$ is .....

(a) {0 , – 3} (b)]– 3 , 0[(c) [– 3 , 0[(d) [– 3 , 0]

(3) If triangle ABC ~ triangle XYZ and 2 AB = 3 XY , then the perimeter of triangle ABC : the perimeter of triangle XYZ = ...

(a) 4 : 9 (b) 9 : 4 (c) 2 : 3 (d) 3 : 2

(4) In the opposite figure :



If $\overline{AB} \cap \overline{CD} = \{E\}$, AE = 3 cm.

, CE = 2 cm. , BE = 6 cm.

, then CD = ... cm.

(a) 9 (b) 8 (c) 11 (d) 6

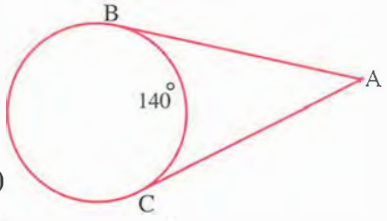
(5) If the ratio between measures of the interior angles of a quadrilateral is 5 : 4 : 9 : 6 , then the measure of the smallest angle equals .....

(a) $\frac{\pi}{12}$ (b) $\frac{\pi}{3}$ (c) $\frac{5\pi}{12}$ (d) $\frac{2\pi}{3}$

(6) If $x + y\,i = \sqrt{-4} + i^{22}$, then $x - y$ = ...

(a) 3 (b) – 3 (c) 2 (d) – 2

(7) In the opposite figure :



$\overline{AB}$, $\overline{AC}$ are two tangents to the circle , m $(\overset{\frown}{BC})$ = 140°

, then m $(\angle A)$ = ...°

(a) 220 (b) 110

(c) 40 (d) 180

(8) The radian measure of the sum of the angles of the regular pentagon = ...

(a) $\frac{1}{2}\pi$ (b) $\frac{2}{5}\pi$ (c) 2π (d) 3π

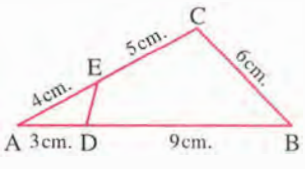
(9) In triangle ABC if $\tan(A + B) = \frac{24}{7}$, then cos C = ...

(a) $\frac{24}{25}$ (b) $\frac{-24}{25}$ (c) $\frac{-7}{25}$ (d) $\frac{7}{25}$

(10) If (2 – i) is one of the roots of the equation : $x^2 - 4x + k = 0$, then k = ...

(a) 3 (b) – 3 (c) 5 (d) – 5

(11) In the opposite figure :



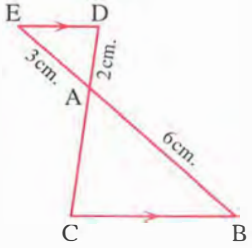
$E \in \overline{AC}$, $D \in \overline{AB}$ where AD = 3 cm. , BD = 9 cm.

, BC = 6 cm. , EC = 5 cm. , EA = 4 cm.

, then the length of $\overline{ED}$ = ... cm.

(a) 3 (b) 2 (c) 6 (d) 5

(12) In the opposite figure :



If $\overline{ED} \,//\, \overline{CB}$, $\overline{DC} \cap \overline{BE} = \{A\}$

, AE = 3 cm. , AB = 6 cm. , AD = 2 cm.

, then CD = ... cm.

(a) 6 (b) 4

(c) 3 (d) 5

(13) If $\sin\theta = \frac{3}{5}$ where $90° < \theta < 180°$, then $\sin(180° - \theta) + \cos(\theta - 90°) =$ .....

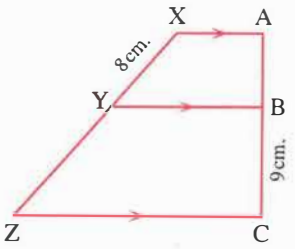
(a) $\frac{4}{5}$ (b) 1 (c) $\frac{6}{5}$ (d) $\frac{-6}{5}$

(14) The function f where $f(x) = x^2 + 2x - 3$ is negative at $x \in$ .....

(a) $[-3, 1]$ (b) $]-1, 3[$ (c) $[-3, -1]$ (d) $]-3, 1[$

(15) In the opposite figure :

If $\overline{AX} // \overline{BY} // \overline{CZ}$, YZ = 2 AB , BC = 9 cm. , XY = 8 cm. , then AB = ... cm.

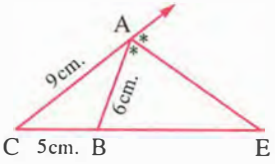


(a) 5 (b) 6

(c) 10 (d) 4

(16) In the opposite figure :

If BC = 5 cm. , CA = 9 cm. , $\overrightarrow{AE}$ bisects the exterior angle at A , AB = 6 cm. , then BE = ... cm.



(a) 8 (b) 10 (c) 6 (d) 7

(17) $\cos(180° + \theta) + \sin(90° + \theta) =$ .....

(a) $2\sin\theta$ (b) $2\cos\theta$ (c) 2 (d) zero

(18) If the roots of the equation : $x^2 + kx + 4 = 2x$ are real and equal , then k = ...

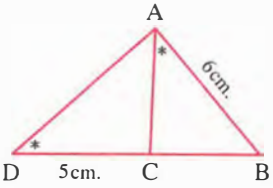
(a) -2 (b) 6 (c) -2 or 6 (d) 2 or -6

(19) If $a + b\,i = \frac{2+i}{2-i}$, then $a^2 + b^2 =$ .....

(a) $-i$ (b) -1 (c) 2 (d) 1

(20) In the opposite figure :

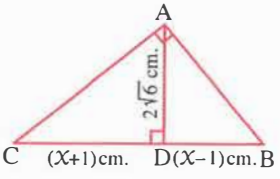
If m(∠ BAC) = m(∠ D) , AB = 6 cm. , DC = 5 cm. , then BC = ... cm.



(a) 4 (b) 6 (c) 9 (d) 10

(21) In the opposite figure :

$x =$ ..... cm.



(a) 6 (b) 7

(c) 5 (d) 8

(22) If the two roots of the equation : $x^2 - 4x + k = 0$ are real , then k ∈ .....

(a) $]-\infty, 4[$ (b) $]4, \infty[$ (c) $]-\infty, 4]$ (d) $[4, \infty[$

(23) If L and M are the two roots of the equation : $x^2 - 5x + 6 = 0$, then the equation whose roots are (L – M) and (M – L) is .....

(a) $x^2 + 1 = 0$ (b) $x^2 - 1 = 0$ (c) $x^2 + 25 = 0$ (d) $x^2 - x = 0$

(24) If $\sin 8\theta \sec\theta = 1$ where $\theta \in]0 , \frac{\pi}{15}[$, then $\tan 6\theta$ could equal .....

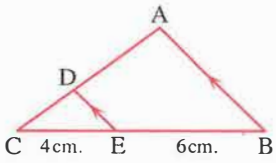
(a) 1 (b) $\frac{1}{2}$ (c) $\sqrt{3}$ (d) $\frac{\sqrt{3}}{3}$

(25) In the opposite figure :

If $\overline{ED} // \overline{BA}$, BE = 6 cm. , EC = 4 cm.

, the area of the figure ABED = 42 cm^2

, then the area of Δ CED = ... cm^2



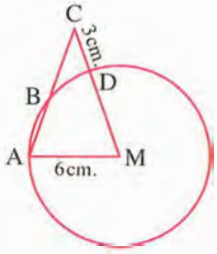
(a) 16 (b) 10 (c) 8 (d) 20

(26) In the opposite figure :

If the length of the radius of a circle of center M is 6 cm.

, CD = 3 cm. , m (∠ A) = m (∠ M)

, then CB = ... cm.



(a) 5 (b) 4

(c) 3 (d) 6

(27) If the ratio between the perimeters of two similar triangles is 1 : 4 , the area of the smaller is 15 cm^2 , then the area of the bigger = ... cm^2

(a) 16 (b) 160 (c) 225 (d) 240

Second Essay questions

Answer the following questions :

1 ABCD is a quadrilateral in which AB = AD , $\overrightarrow{AX}$ bisects ∠ BAC and intersects $\overline{BC}$ at X , $\overrightarrow{AY}$ bisects ∠ DAC and intersects $\overline{CD}$ at Y **Prove that :** $\overline{XY} // \overline{BD}$

2 If L , M are the roots of the equation : $x^2 - 2x + 3 = 0$

form the equation of roots $L^3 M$, $L M^3$

7 Alexandria Governorate

Borg El Arab Zone
Mathematics Supervision

First Multiple choice questions

Interactive tests (7)

Choose the correct answer from those given :

(1) If $\mathcal{X} = i$ is one of two roots of the equation : $\mathcal{X}^2 - i\,\mathcal{X} + k = 0$, then k = ...

(a) 0 (b) -1 (c) 4 (d) i

(2) $(2 + i)(2 - i)(1 + i)^2$ = ...

(a) 10 i (b) $-10 + 10$ i (c) $5 + i$ (d) $-1 + 4$ i

(3) The function $f(\mathcal{X}) = -0.25\,\mathcal{X}$ is negative at $\mathcal{X} \in$ .....

(a) $[0.25 , \infty[$ (b) $[-0.25 , \infty[$

(c) $]0 , \infty[$ (d) $]-\infty , 0.25[$

(4) The function $f(\mathcal{X}) = \mathcal{X}(11 - 2\,\mathcal{X}) + 6$ is not negative at $\mathcal{X} \in$ .....

(a) $[2 , 3[$ (b) $\mathbb{R} - [2 , 3[$ (c) $]2 , 6[$ (d) $[-0.5 , 6]$

(5) The solution set of the inequality : $(\mathcal{X} - 2)(\mathcal{X} - 1) \leq 6$ in $\mathbb{R}$ is .....

(a) $[-1 , 4]$ (b) $\mathbb{R} - [1 , 2]$ (c) $]2 , 3[$ (d) $[1 , 6]$

(6) If L , M are the two roots of the equation : $(2 - k)\,\mathcal{X}^2 + (2 - k)\,\mathcal{X} + 4 = 0$ and L M = 2 , then k = ...

(a) 5 (b) 0 (c) 4 (d) -2

(7) If the two roots of the equation : $-\mathcal{X}(\mathcal{X} - 4) = k$ are real , then $k \in$ .....

(a) $]-\infty , 4[$ (b) $[-0.25 , \infty[$ (c) $]-\infty , 4]$ (d) $]-\infty , -4[$

(8) If L , M are the two roots of the equation : $\mathcal{X}^2 - 3\,\mathcal{X} + 2 = 0$, then the equation with two roots L + 1 , M + 1 is .....

(a) $\mathcal{X}^2 - 5\,\mathcal{X} + 6 = 0$ (b) $\mathcal{X}^2 - 6\,\mathcal{X} + 5 = 0$

(c) $\mathcal{X}^2 + 5\,\mathcal{X} + 6 = 0$ (d) $\mathcal{X}^2 - 4\,\mathcal{X} + 3 = 0$

(9) ABCDEF is a regular hexagon of side length 6 cm. inscribed in a circle , then the length of arc BC = ... cm.

(a) 3π (b) 2π (c) π (d) 6π

(10) If θ is the measure of an angle in the standard position , its terminal side intersect the unit circle at the point (0.6 , y) , then csc θ = ... , $y > 0$

(a) 0.6 (b) 0.8 (c) 1.25 (d) 1.4

(11) If $\cot(90° - \theta) = \cot(2\theta)$, $0 < \theta < 90°$, then $\sin 3\theta$ = ...

(a) 3 (b) 4 (c) 2 (d) 1

(12) The angle of measure 2.02^{rad} lies in the ..... quadrant.

(a) second (b) first (c) third (d) fourth

(13) Number of times of intersections between the curve $y = \sin 3x$ with the x-axis on the interval $[0 , 2\pi]$ = ...

(a) 2 (b) 7 (c) 6 (d) 3

(14) If $\tan\theta = 0.75$, $0 < \theta < 90°$, then $\sec(270° - \theta) \approx$ .....

(a) 1.3 (b) – 1.45 (c) – 1.67 (d) 2.1

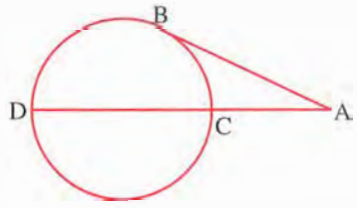
(15) The ratio between two corresponding sides of two similar triangle is 2 : 5 if the area of the first one = 16 cm^2 , then the area of the second one = ... cm^2

(a) 100 (b) 80 (c) 40 (d) 120

(16) In the opposite figure :

AB = 10 cm. , CD = 15 cm.

, then AC = ... cm.



(a) 4 (b) 5

(c) 15 (d) 18

(17) $\overline{AB}$ is a chord of length = 8 cm. in a circle of center M , $\overleftrightarrow{MC} \perp \overline{AB}$ to intersect it at C and intersect the circle at D if CD = 2 cm. , then the length of the radius of the circle = ... cm.

(a) 8 (b) 4 (c) 5 (d) 7

(18) Two concentric circles at M , the lengths of their radii are 12 cm. , 7 cm. , $\overline{AD}$ is a chord in the larger circle to intersect the smaller circle at B and C respectively , then AB × AC = ...

(a) 19 (b) 84 (c) 25 (d) 95

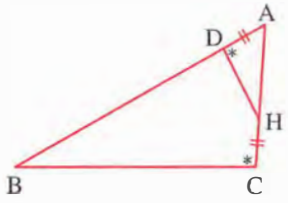
(19) In the opposite figure :

AD = 3 cm. , AH = 6 cm.

, AD = HC , DH = x cm.

, BC = $(x + 10)$ cm.

, then x = ...



(a) 5 (b) 3 (c) 8 (d) 4

(20) If k is the scale factor of similarity of polygon M_1 to polygon M_2 , $k > 1$, then the polygon M_1 is ..... polygon M_2

(a) congruent to (b) enlargement to

(c) minimization to (d) half the area of the

(21) XYZ is a right-angled triangle at Y , $\overline{YL} \perp \overline{XZ}$, XY = 6 cm. , YZ = 8 cm. , then XL = ...

(a) 10 (b) 4.8 (c) 3.6 (d) 6.4

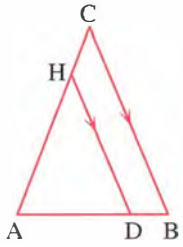
(22) In the opposite figure :

$\overline{DH} // \overline{BC}$, CH = $\mathcal{X}$ cm.

, AH = 12 cm. , BD = 3 cm.

, AD = ($\mathcal{X}$ + 5) cm.

, then $\mathcal{X}$ = ...



(a) 9 (b) 12 (c) 4 (d) 3

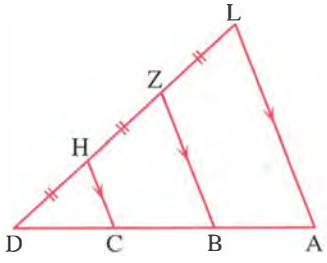
(23) In the opposite figure :

$\overline{CH} // \overline{BZ} // \overline{AL}$, DH = HZ = ZL

, AB = $\mathcal{X}$ cm. , BC = 2 $\mathcal{X}$ – 7 cm.

, CD = $\mathcal{X}$ – y cm.

, then $\mathcal{X}$ + y = ... cm.



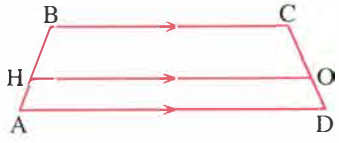
(a) 9 (b) 7 (c) 5 (d) 3

(24) In the opposite figure :

$\overline{BC} // \overline{HO} // \overline{AD}$, BC = 16 cm.

, AD = 24 cm. , $\frac{BH}{HA} = \frac{5}{3}$

, then HO = ... cm.



(a) 12 (b) 17 (c) 21 (d) 25

(25) ABC is a triangle in which AB = 8 cm. , AC = 6 cm. , $\overrightarrow{AD}$ bisect ∠ CAB and intersect $\overline{BC}$ at D , AD = 6 cm. , then BD = ... cm.

(a) 4 (b) 8 (c) 3 (d) 6

(26) ABC is a triangle in which $\overrightarrow{BD}$ bisects the exterior angle B and intersects $\overrightarrow{AC}$ at D , if AB = 8 cm. , BC = 6 cm. , DC = 15 cm. , then AC = ... cm.

(a) 5 (b) 10 (c) 12 (d) 20

(27) If a point C is outside the circle M , $\overline{CB}$ is tangent to the circle at B and CD intersecting circle at H , D and passes throw the center M , if m (∠ C) = 20° , then the measure of the arc $(\overset{\frown}{BD})$ = ...°

(a) 90 (b) 110 (c) 100 (d) 60

Second Essay questions

Answer the following questions :

1 **Find the necessary condition to be one of two roots of the equation :**
$b x^2 - 4 b x + a = 0$ three times of the other root.

2 ABC is triangle in which $\overrightarrow{BM}$, $\overrightarrow{CM}$ bisects exterior angles at B and C respectively , $\overrightarrow{BM} \cap \overrightarrow{CM} = \{M\}$ **Prove that :** $\overrightarrow{AM}$ bisects $\angle BAC$

8 El-Kalyoubia Governorate Mathematics Supervision

First Multiple choice questions

Interactive tests (8)

Choose the correct answer from those given :

(1) If one of the two roots of the equation : $x^2 - (k - 9) x - 17 = 0$ is the additive inverse of the other root , then k = ...

(a) 17 (b) 9 (c) – 9 (d) – 17

(2) The conjugate of the number $3 - 2 i$ is .....

(a) $-3 + 2 i$ (b) $-3 - 2 i$ (c) $3 + 2 i$ (d) $2 + 3 i$

(3) The equation where its two roots are $3 i$ and $-3 i$ is .....

(a) $x^2 = 9 i$ (b) $x^2 - 9 = 0$

(c) $x^2 + 9 = 0$ (d) $x^2 - 6 x + 9 = 0$

(4) The function $f(x) = 6 - 2 x$ is not negative at .....

(a) $x > 3$ (b) $x < 3$ (c) $x \geq 3$ (d) $x \leq 3$

(5) The equation : $2 x^2 - 4 x + k = 0$ has two different real roots if .....

(a) k = 8 (b) k > 2 (c) k < 2 (d) k = 2

(6) The solution set of the inequality : $x^2 - 5 x \leq 0$ in $\mathbb{R}$ is .....

(a) $[0 , 5]$ (b) $]5 , \infty[$ (c) $]-\infty , 5[$ (d) $\varnothing$

(7) If the two roots of the equation : $a x^2 + b x + c = 0$ are 4 and 5 , then $\frac{b + c}{a}$ = ...

(a) 20 (b) 11 (c) 9 (d) 5

(8) The measure of the central angle in a circle of radius length 15 cm. and opposite to an arc of length 5π cm. = ...°

(a) 60 (b) 90 (c) 120 (d) 150

(9) The angle whose measure $\frac{7\pi}{6}$ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(10) The maximum value of the function : $f(x) = 2 \sin 5x$ is .....

(a) 5 (b) 2 (c) -2 (d) -5

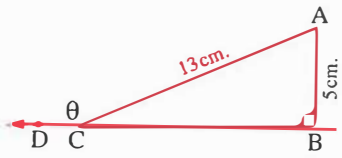
(11) The general solution of the equation : $\tan 5\theta = \cot 4\theta$ is ..... where $n \in \mathbb{Z}$

(a) $\frac{\pi}{2} + \frac{2\pi}{9} n$ (b) $\frac{\pi}{18} + \frac{2\pi}{9} n$ (c) $\frac{\pi}{18} + \frac{\pi}{9} n$ (d) $\frac{\pi}{2} + \frac{\pi}{9} n$

(12) In the opposite figure :

If $D \in \overrightarrow{BC}$

, then $\cos\theta$ = ...

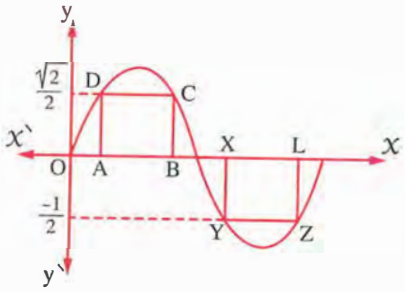


(a) $\frac{12}{13}$ (b) $\frac{5}{13}$

(c) $\frac{-5}{13}$ (d) $\frac{-12}{13}$

(13) The opposite figure represent the function $f(x) = \sin x$

, then $\frac{\text{the area of rectangle ABCD}}{\text{the area of rectangle XYZL}}$ = ...



(a) $\frac{3\sqrt{2}}{4}$ (b) $\frac{3\sqrt{2}}{2}$

(c) $\frac{5\sqrt{2}}{2}$ (d) $\frac{5\sqrt{2}}{4}$

(14) If L and M are the two roots of the equation : $x^2 - 7x + 3 = 0$

, then the value of : $L^2 M + L M^2$ = ...

(a) 7 (b) 3 (c) 10 (d) 21

(15) If $\Delta ABC \sim \Delta DEF$, AB = 2 cm. , DE = 4 cm. , EF = 8 cm.

, then the length of $\overline{BC}$ = ... cm.

(a) 1 (b) 2 (c) 3 (d) 4

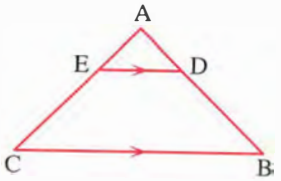
(16) If the ratio between the perimeter of two similar polygons is 4 : 9 , then the ratio between their areas is .....

(a) 2 : 3 (b) 4 : 9 (c) 16 : 81 (d) 81 : 16

(17) In the opposite figure :

$\overline{DE} // \overline{BC}$, 2 AD = DB , DE = 4 cm.

, then BC = ... cm.



(a) 6 (b) 8

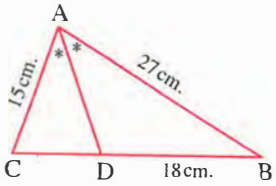
(c) 12 (d) 16

(18) In the opposite figure :

$\overrightarrow{AD}$ bisects $\angle BAC$, BD = 18 cm.

, AB = 27 cm. , AC = 15 cm.

, then AD = ... cm.



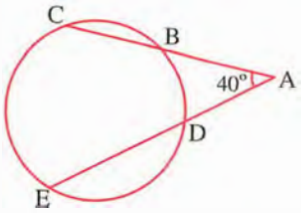
(a) 15 (b) 10 (c) 9 (d) 8

(19) In the opposite figure :

$\overrightarrow{CB} \cap \overrightarrow{ED} = \{A\}$, m $(\overset{\frown}{CE}) = 130°$

, m $(\angle A) = 40°$

, then m $(\overset{\frown}{BD})$ = ... °



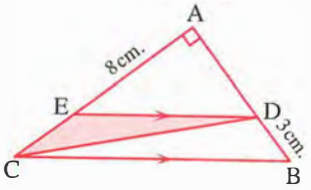
(a) 40 (b) 50 (c) 65 (d) 85

(20) In the opposite figure :

$\overline{DE} // \overline{BC}$, m $(\angle A) = 90°$

, BD = 3 cm. , AE = 8 cm.

, then the area of Δ DEC = ... cm^2



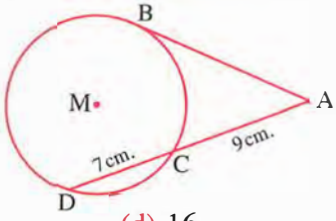
(a) 24 (b) 18 (c) 12 (d) 10

(21) In the opposite figure :

$\overrightarrow{AB}$ is tangent to the circle M

, AC = 9 cm. , CD = 7 cm.

, then AB = ... cm.



(a) 4 (b) $3\sqrt{7}$ (c) 12 (d) 16

(22) If $P_M(A) = 64$, MA = 10 cm. , then the circumference of the circle M = ...

(a) 6π (b) 10π (c) 12π (d) 36π

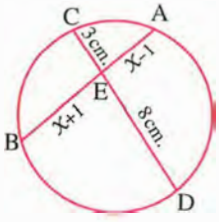
(23) In the opposite figure :

$\overline{AB} \cap \overline{CD} = \{E\}$, AE = $x - 1$

, EB = $x + 1$, CE = 3 cm.

, ED = 8 cm.

, then x = ... cm.



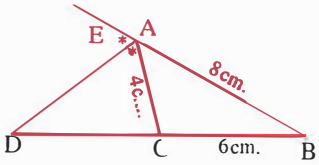
(a) 3 (b) 4 (c) 5 (d) 6

(24) In the opposite figure :

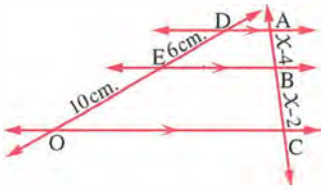
$\overrightarrow{AD}$ bisects $(\angle EAC)$, AB = 8 cm.

, BC = 6 cm. , AC = 4 cm.

, then CD = ... cm.



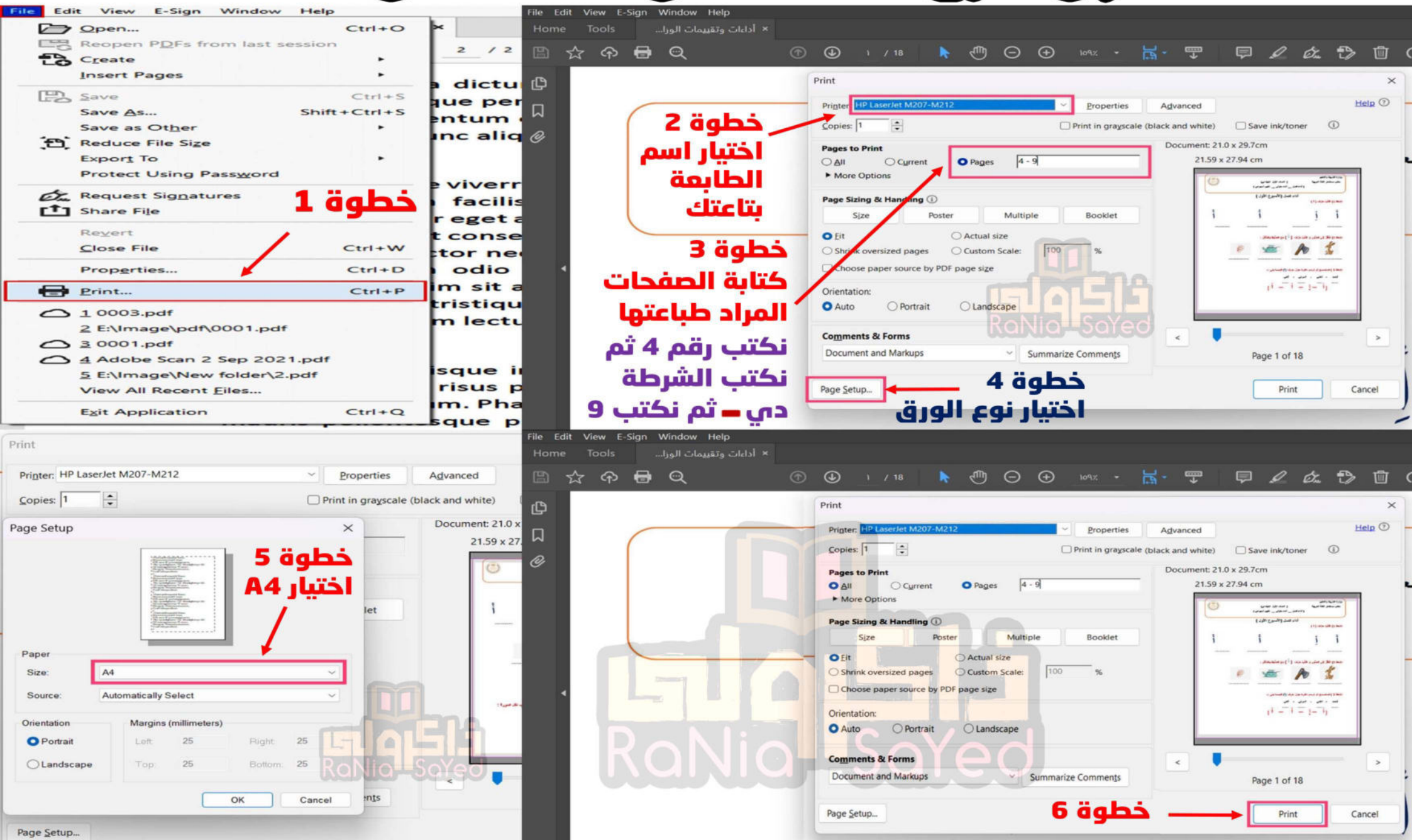
(a) 6 (b) 8 (c) 9 (d) 12


D
A
E
6cm.
X-4
B
10cm.
X-2
O
C


*

كيفية طباعة صفحات معينة من ملف معين

مثلا ازاى نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجانا وحصريا

امتحانات رقم (2)

الترم الاول





1 Cairo Governorate

Shoubra Educational Zone
Mathematics Supervision

First Multiple choice questions

Interactive tests ①

Choose the correct answer from the given ones :

(1) The simplest form of the imaginary number i^{43} = ...

(a) 1 (b) – 1 (c) – i (d) i

(2) The equation whose roots are : 2 i , – 2 i is .....

(a) $x^2 + 2 = 0$ (b) $x^2 + 4 = 0$ (c) $x^2 = 4$ (d) $x^2 = 2$

(3) The function $f : f(x) = x^2 - 4$ is negative when : $x \in$ .....

(a) $\mathbb{R} - [-2, 2]$ (b) $\mathbb{R} -]-2, 2[$ (c) $[-2, 2]$ (d) $]-2, 2[$

(4) The smallest positive measure of the angle of measure – 240° is ..... in radian.

(a) $\frac{2\pi}{3}$ (b) $\frac{4\pi}{3}$ (c) $\frac{\pi}{3}$ (d) 2π

(5) If $10 \sin x = 6$, where x is the greatest positive measure , $x \in [0, 2\pi[$, then sec $(540° + x)$ = ...

(a) $\frac{-5}{4}$ (b) $\frac{5}{4}$ (c) $\frac{-5}{3}$ (d) $\frac{3}{5}$

(6) If $\Delta ABC \sim \Delta DEF$, BC = 3 EF , then the factor of similarity of ΔABC to ΔDEF = ...

(a) 3 (b) 1 (c) $\frac{1}{3}$ (d) $\frac{2}{3}$

(7) **In the opposite figure :**

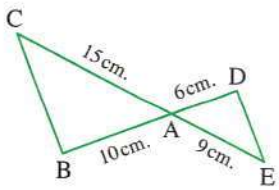
$\overline{DB} \cap \overline{EC} = \{A\}$

, AE = 9 cm. , AB = 10 cm.

, AD = 6 cm. , AC = 15 cm.

If the area of ΔADE = 18 cm^2.

, then the area of ΔABC = ... cm^2



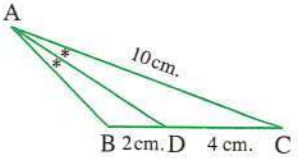
(a) 225 (b) 30 (c) 54 (d) 50

(8) **In the opposite figure :**

$\overrightarrow{AD}$ bisects $\angle BAC$

, BD = 2 cm. , DC = 4 cm.

, AC = 10 cm. , then AD = ... cm.

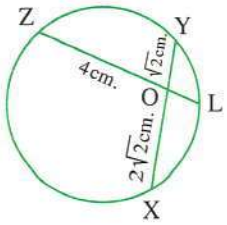


(a) $\sqrt{42}$ (b) $\sqrt{58}$ (c) 9 (d) 5

(9) In the opposite figure :

$\overline{XY}$, $\overline{ZL}$ are two intersecting chords at O If OY = $\sqrt{2}$ cm.

, OX = $2\sqrt{2}$ cm. , OZ = 4 cm. , then OL = ... cm.



(a) 4 (b) 2

(c) 1 (d) $\frac{1}{2}$

(10) If a + 3 i , 4 – b i are two conjugate numbers , then a + b = ...

(a) – 7 (b) 7 (c) – 1 (d) 1

(11) If L , $\frac{1}{L}$ are the roots of the equation : a X^2 – 3 X + 2 = 0 , then a = ...

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) 3 (d) 2

(12) The function f : f (X) = 2 X – 3 is positive when .....

(a) $X > \frac{2}{3}$ (b) $X < \frac{2}{3}$ (c) $X > \frac{3}{2}$ (d) $X < \frac{3}{2}$

(13) The range of the function : f (X) = cos (– 2 X) equals .....

(a) [– 1 , 1] (b)]– 1 , 1[(c) [– 2 , 2] (d)]– 2 , 2[

(14) $\sin(-\theta) + \frac{\sec 15°}{\csc 75°} + \cos(270° + \theta)$ = ...

(a) 0 (b) 1 (c) – 1 (d) sin θ

(15) If the ratio between the areas of two similar polygons is 1 : 4 , then the ratio between the lengths of two corresponding sides of them is .....

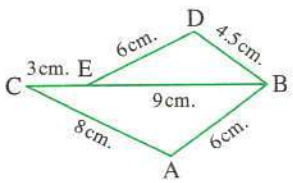
(a) 1 : 16 (b) 1 : 4 (c) 1 : 2 (d) 2 : 1

(16) In the opposite figure :

AB = 6 cm. , AC = 8 cm.

, CE = 3 cm. , EB = 9 cm.

, BD = 4.5 cm. , DE = 6 cm.



, then the factor of similarity of Δ ABC to Δ DBE = ...

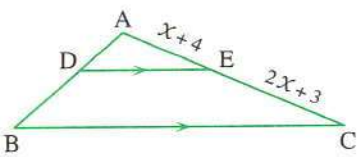
(a) 9 : 16 (b) 16 : 9 (c) 3 : 4 (d) 4 : 3

(17) In the opposite figure :

$\overline{DE}$ // $\overline{BC}$

, AD : AB = 2 : 5

, then X = ...



(a) 8 (b) 6

(c) 4 (d) 2

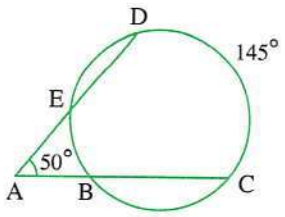
(18) In the opposite figure :

m (∠ A) = 50°

m $(\overset{\frown}{DC})$ = 145°

m $(\overset{\frown}{EB})$ = (2 $\mathcal{X}$ – 5)°

, then $\mathcal{X}$ = ...



(a) 35 (b) 30 (c) 25 (d) 20

(19) If one of the two roots of the equation : $\mathcal{X}^2$ – (k – 3) $\mathcal{X}$ + 5 = 0 is the additive inverse of the other root , then k = ...

(a) 3 (b) – 3 (c) 0 (d) 5

(20) If the product of the two roots of the equation : a $\mathcal{X}^2$ + b $\mathcal{X}$ + c = 0 equals their sum , then .....

(a) a = c (b) a = b (c) b = c (d) b = – c

(21) The measure of the central angle in a circle of radius length 15 cm. and opposite to an arc of length 5 π cm. = ...

(a) 90° (b) 120° (c) 60° (d) 150°

(22) The directed angle which its terminal side cuts the unit circle at the point (a , b) where : a < 0 , b < 0 lies in the ..... quadrant.

(a) 4^{th} (b) 3^{rd} (c) 2^{nd} (d) 1^{st}

(23) The triangle in which two angles of measures 55° , 65° is similar to triangle in which two angles of measure 55° , ...

(a) 70° (b) 50° (c) 55° (d) 60°

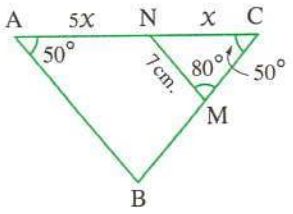
(24) If the ratio between the lengths of two corresponding sides of two similar triangles is 3 : 5 and the area of the greater triangle = 100 cm^2 , then the area of the smaller triangle = ... cm^2

(a) 36 (b) 46 (c) 64 (d) 26

(25) If the radius length of the circle M equals 4 cm. and B is a point on the circle , then P_M (B) = ...

(a) 4 (b) 0 (c) 16 (d) 12

(26) In the opposite figure :



If CN = X , NA = 5 X

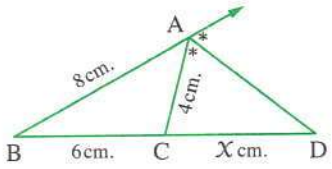
MN = 7 cm.

, then AB = ... cm.

(a) 42 (b) 35

(c) 28 (d) 21

(27) In the opposite figure :



$\overrightarrow{AD}$ bisects ∠ BAC externally

, AB = 8 cm.

, BC = 6 cm.

, AC = 4 cm. , then X = ... cm.

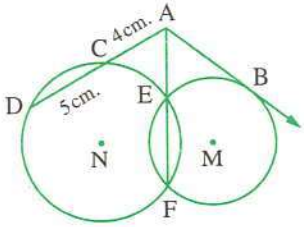
(a) 9 (b) 8 (c) 7 (d) 6

Second Essay questions

Answer the following questions :

1 Determine the sign of the function : $f(X) = X^2 - X - 12$, then find the solution set of the inequality : $X^2 - 12 > X$

2 **In the opposite figure :**



AC = 4 cm.

, CD = 5 cm.

$\overrightarrow{AB}$ touches the circle M at B

Find with proof the length of : $\overline{AB}$

2 Cairo Governorate

El-Salam Educational Zone
Math's Supervision

First Multiple choice questions

Interactive tests ②

Choose the correct answer from the given ones :

(1) The simplest form of the number 6 i^{58} is .....

(a) 6 (b) – 6 (c) 6 i (d) – 6 i

(2) The conjugate of the number 9 is .....

(a) – 9 i (b) 9 i (c) – 9 (d) 9

(3) The simplest form of the number $\frac{3-2i}{4-3i}$ is .....

(a) $\frac{1}{25}+\frac{18}{25}i$ (b) $\frac{1}{25}-\frac{18}{25}i$ (c) $\frac{18}{25}+\frac{1}{25}i$ (d) $\frac{18}{25}-\frac{1}{25}i$

(4) The quadratic equation which has one of its two roots equal (3 + 4 i) is .....

(a) $x^2+6x+25=0$ (b) $x^2-6x-25=0$

(c) $x^2-6x+25=0$ (d) $x^2+6x-25=0$

(5) If $3x^2+4x+m-3=0$ is a quadratic equation , and its discriminant = 4 , then m = ...

(a) – 4 (b) 3 (c) – 3 (d) 4

(6) If the two roots of the equation : $x^2 = k + 5$ are real different , then k .....

(a) < 5 (b) < – 5 (c) > 5 (d) > – 5

(7) If the product of the two roots of the a quadratic equation : $2x^2-3x+k-3=0$ equals 1 , then k = ...

(a) 2 (b) 3 (c) 4 (d) 5

(8) The sign of the function $f(x) = 6 - 2x$ is positive when x .....

(a) > 3 (b) < 3 (c) > – 3 (d) < – 3

(9) The angle whose measure 1920° lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(10) The length of the arc which opposite to a central angle of measure $\frac{\pi}{3}$, in a circle of radius length 6 cm. equal .....

(a) $\frac{3\pi}{2}$ (b) 2π (c) 3π (d) $\frac{5\pi}{2}$

(11) If the terminal side of a positive angle θ in standard position intersects the unit circle at point $\left(\frac{\sqrt{3}}{2}, y\right)$, where $0 < \theta < 90°$, then cot θ = ...

(a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) $2\sqrt{3}$ (d) $\frac{-1}{\sqrt{3}}$

(12) 3 sin θ ∈ .....

(a) [– 1 , 1] (b) [– 3 , 3] (c)]– 3 , 3[(d)]– 1 , 1[

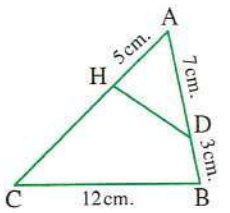
(13) 2 sin θ = – 1 where $\pi < \theta < \frac{3\pi}{2}$, then m (∠ θ) = ...

(a) 130° (b) 210° (c) 225° (d) 240°

(14) sin (θ – 90°) = ...

(a) sin θ (b) cos θ (c) – sin θ (d) – cos θ

(15) In the opposite figure :



The figure DHCB is cyclic quadrilateral

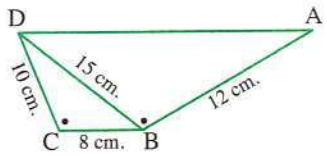
, AD = 7 cm. , AH = 5 cm. , DB = 3 cm.

, BC = 12 cm. , then DH = ... cm.

(a) 14 (b) 9

(c) 10 (d) 6

(16) In the opposite figure :



m (∠ ABD) = m (∠ BCD)

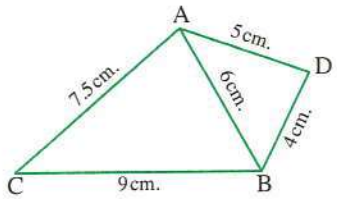
AB = 12 cm. , BD = 15 cm. , DC = 10 cm.

, BC = 8 cm. , then AD = ... cm.

(a) 13 (b) 15.5

(c) 22.5 (d) 20

(17) In the opposite figure :



the ratio between the area

of Δ DBA and area Δ ABC is .....

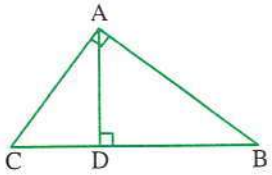
(a) $\frac{2}{3}$ (b) $\frac{5}{9}$

(c) $\frac{4}{9}$ (d) $\frac{25}{81}$

(18) Two similar rectangles , the dimensions of the first are 7 cm. , 4 cm. and the perimeter of the second is 22 cm. , then the scale factor of the similarity is .....

(a) $\frac{4}{7}$ (b) $\frac{7}{4}$ (c) $\frac{1}{11}$ (d) 1

(19) In the opposite figure :



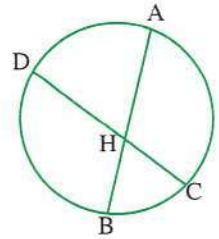
m (∠ A) = m (∠ ADB) = 90°

, then Δ BDA ~ Δ .....

(a) ADC (b) ABC

(c) CAB (d) DAC

(20) In the opposite figure :



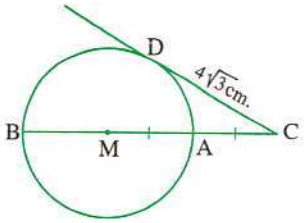
$\overline{AB} \cap \overline{CD} = \{H\}$, HB = x^2 cm.

CH = 6 cm. , HD = 10 cm.

, AH = 15 cm. , then x = ...

(a) 2 (b) ± 2 (c) 4 (d) ± 4

(21) In the opposite figure :



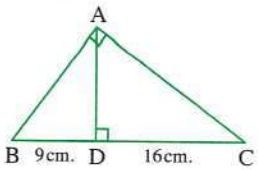
$\overline{AB}$ diameter on the circle M

, $\overline{CD}$ tangent to the circle at D

$CD = 4\sqrt{3}$ cm. , CA = AM , then AB = ... cm.

(a) 4 (b) 16 (c) 8 (d) 3

(22) In the opposite figure :

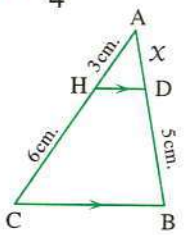


$m(\angle A) = 90°$, $\overline{AD} \perp \overline{BC}$, BD = 9 cm. , DC = 16 cm.

, then $\frac{AB}{AC}$ = ...

(a) $\frac{9}{16}$ (b) $\frac{9}{25}$ (c) $\frac{16}{25}$ (d) $\frac{3}{4}$

(23) In the opposite figure :

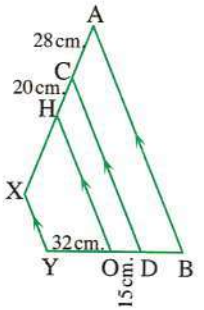


X = ... cm.

(a) 2 (b) 2.5

(c) 3 (d) 3.5

(24) In the opposite figure :



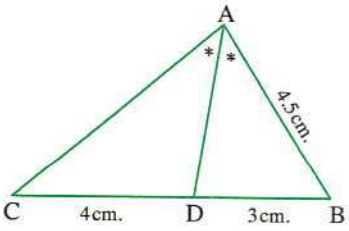
$\overline{AB} // \overline{CD} // \overline{HO} // \overline{XY}$

, then BD = ... cm.

(a) 33 (b) 28

(c) 21 (d) 27

(25) In the opposite figure :



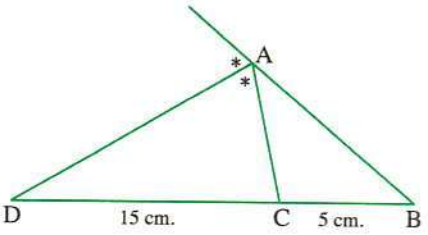
$\overrightarrow{AD}$ bisect $\angle A$, BD = 3 cm. , DC = 4 cm.

, AB = 4.5 cm. , then AC = ... cm.

(a) 6 (b) 4.8

(c) 7 (d) 8

(26) In the opposite figure :



$\overrightarrow{AD}$ bisect the exterior angle at vertex A

, BC = 5 cm. , CD = 15 cm.

, then AB : AC = ...

(a) 3 : 1 (b) 1 : 3

(c) 4 : 1 (d) 4 : 3

(27) If A is a point outside a circle of centre M , AM = 7 cm. and $P_M(A) = 24$

, then the radius length of the circle equal ..... cm.

(a) 5 (b) 4 (c) 3 (d) 2

Second Essay questions

Answer the following questions :

1 **Find the solution set of the inequality in $\mathbb{R}$: $x^2 + x - 2 <$ zero**

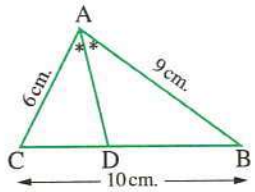
2 **In the opposite figure :**

$\overrightarrow{AD}$ bisect $\angle BAC$

AB = 9 cm. , AC = 6 cm.

, BC = 10 cm.

Find : the length of each $\overline{BD}$ and $\overline{AD}$



3 **Cairo Governorate**

El-Khalifa and El-Mokattam Educational Zone
Mathematics Supervisoin

First Multiple choice questions

Interactive tests (3)

Choose the correct answer from the given ones :

(1) The conjugate of $(i - i^2)$ is .....

(a) $1 - i$ (b) $1 + i$ (c) $-i - 1$ (d) $i - 1$

(2) The arc of length 2π cm. , in a circle of radius 12 cm. is opposite to central angle of measure .....

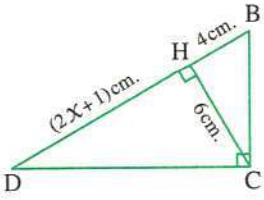
(a) 2π (b) $\frac{\pi}{6}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$

(3) **In the opposite figure :**

x = ...

(a) 8 (b) 4

(c) 6 (d) 4.8



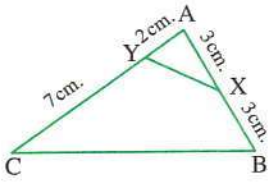
(4) **In the opposite figure :**

If area of $\Delta ABC = 18$ cm^2

, then area of ΔAXY = ... cm^2

(a) 9 (b) 36

(c) 2 (d) 6

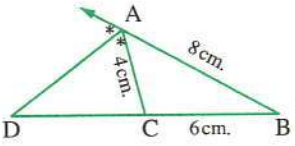


(5) **In the opposite figure :**

CD = ... cm.

(a) 2 (b) 6

(c) 4 (d) 8



(6) The sign of function $f : f(\mathcal{X}) = 6 - 2\mathcal{X}$ is non positive when .....

(a) $\mathcal{X} > 3$ (b) $\mathcal{X} \leq 3$ (c) $\mathcal{X} < 3$ (d) $\mathcal{X} \geq 3$

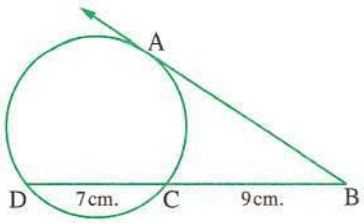
(7) If $\sin\theta = \frac{-1}{2}$, θ is the smallest positive angle , then θ = ...

(a) 30° (b) 150° (c) 210° (d) 330°

(8) In the opposite figure :

$\overrightarrow{BA}$ is tangent , BC = 9 cm. , CD = 7 cm.

, then AB = ... cm.



(a) 63 (b) 144

(c) 12 (d) $\frac{9}{16}$

(9) If $\mathcal{X} = -1$ is one of the roots of the equation : $\mathcal{X}^2 - k\mathcal{X} - 6 = 0$

, then the sum of two roots = ...

(a) – 5 (b) 6 (c) – 6 (d) 5

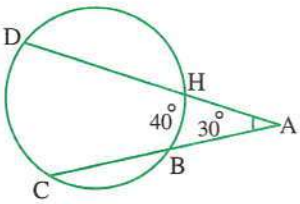
(10) If the range of the function $f : f(\theta) = 2a \sin\theta$ is the interval $[-6 , 6]$, then a = ...

(a) 3 (b) – 3 (c) 6 (d) ± 3

(11) In the opposite figure :

$m(\angle A) = 30°$, $m(\overset{\frown}{BH}) = 40°$

, then $m(\overset{\frown}{CD})$ = ...



(a) 30° (b) 40°

(c) 70° (d) 100°

(12) M is a circle , A is a point in its plane where MA = 6 cm. , $P_M(A) = -13$

, then area of circle = ... cm^2 $\left(\pi = \frac{22}{7}\right)$

(a) 154 (b) 44 (c) 144 (d) 7

(13) The solution set of the inequality : $-\mathcal{X}(\mathcal{X} + 2) \geq 0$ in $\mathbb{R}$ is .....

(a) $\{0 , -2\}$ (b) $[-2 , 0]$ (c) $]-2 , 0[$ (d) $[-2 , 2]$

(14) If $\sin(\theta + 13) = \cos(\theta + 17)$ where θ is positive acute angle , then $\tan\theta$ = ...

(a) $\sqrt{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

(15) If the ratio between areas of two similar triangles equals 9 : 25 , and the perimeter of the smaller triangle 60 cm. , then perimeter of the greater triangle equals .....

(a) 60 (b) 80 (c) 100 (d) 120

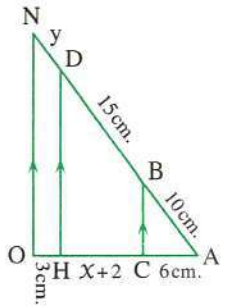
(16) In the opposite figure :

If the lengths are approximated to the nearest cm.

, then $x + y =$ ..... cm.

(a) 5 (b) 7

(c) 11 (d) 12



(17) If L and M are the two roots of the equation : $x^2 - 5x + 7 = 0$, then the equation whose roots L^2 and M^2 is .....

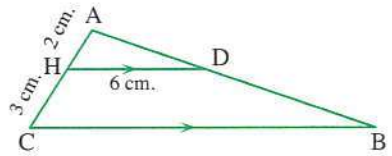
(a) $x^2 + 11x + 49 = 0$ (b) $x^2 - 11x + 49 = 0$

(c) $x^2 - 49x + 11 = 0$ (d) $x^2 + 11x - 49 = 0$

(18) In the opposite figure :

$\overline{DH} \parallel \overline{BC}$, AH = 2 cm. , HC = 3 cm.

, DH = 6 cm. , then BC = ... cm.

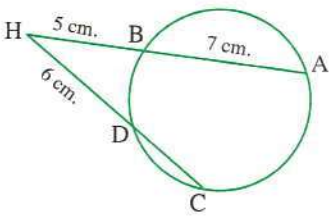


(a) 9 (b) 15 (c) 12 (d) 10

(19) In the opposite figure :

AB = 7 cm. , BH = 5 cm. , DH = 6 cm.

, then length of $\overline{CD}$ = ... cm.



(a) 6 (b) 5

(c) 4 (d) 3

(20) The two roots of equation : $x(x - 2) = 5$ are .....

(a) complex and not real. (b) real and equal.

(c) real and different. (d) 2 and 0

(21) If $\sin\theta = \frac{-1}{2}$, $\cos\theta = \frac{\sqrt{3}}{2}$, then the angle of measure θ lies in the ..... quadrant.

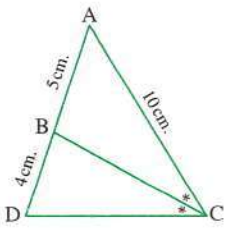
(a) first (b) second (c) third (d) fourth

(22) In the opposite figure :

BC = ... cm.

(a) 8 (b) $4\sqrt{2}$

(c) $2\sqrt{15}$ (d) 6



(23) If one of the roots of the equation : a $x^2 - 3x + 2 = 0$ is multiplicative inverse of the other , then a = ...

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) 2 (d) 3

(24) If the terminal side of angle θ in standard position cuts unit circle at the point $\left(\frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$, then θ = ...

(a) 45° (b) 135° (c) 225° (d) 315°

(25) The simplest form of the imaginary number i^{45} is .....

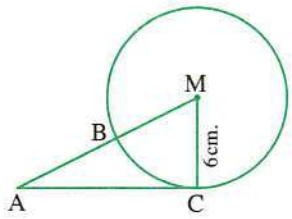
(a) i (b) – 1 (c) – i (d) 1

(26) In the opposite figure :

$\overline{AC}$ is tangent to circle M at C

, MC = 6 cm. , $P_M(A) = 64$

, then AB = ... cm.



(a) 3 (b) 4

(c) 5 (d) 6

(27) The rhombus ABCD is similar to rhombus XYZL , m (∠ A) = 60° and scale of similarity = $\frac{1}{2}$, then m (∠ Z) = ...

(a) 30° (b) 120° (c) 60° (d) 150°

Second Essay questions

Answer the following questions :

1 If L and M are the two roots of the equation : $4x^2 - 6x + a = 0$ and if $L^2 + M^2 = 7LM$, find the value of a

2 **In the opposite figure :**

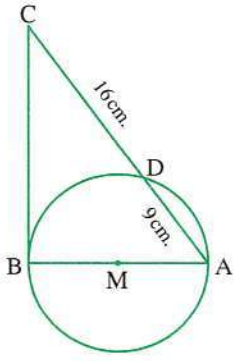
M is a circle , $\overline{AB}$ is a diameter

, $\overline{BC}$ is tangent to circle M at B

and $\overline{AC}$ intersects the circle M at D

, such that CD = 16 cm. , AD = 9 cm.

Find length of the radius of the circle.



4 Giza Governorate — Math's Inspection

First Multiple choice questions

Interactive tests ④

Choose the correct answer from the given ones :

(1) If $X = 3$ is a root of the equation : $X^2 - 5X + 6 = 0$, then the other root is .....

(a) 2 (b) 4 (c) 5 (d) 6

(2) The simplest form of the imaginary number i^{24} = ...

(a) 0 (b) 1 (c) – 1 (d) i

(3) If the roots of the equation : $X^2 + mX + 9 = 0$ are equal real roots , then m = ...

(a) 6 (b) – 6 (c) ± 6 (d) 3

(4) If one of the two roots of the equation : $aX^2 + 3X + 5 = 0$ is the multiplicative inverse of the other root , then a = ...

(a) 1 (b) 5 (c) 3 (d) 4

(5) If L , M are the roots of the equation : $X^2 - 4X + 3 = 0$, then L + M + LM = ...

(a) 0 (b) 3 (c) 4 (d) 7

(6) If L is a root of the equation : $X^2 + 3X + 2 = 0$, then $L^2 + 3L + 2$ = ...

(a) 0 (b) 3 (c) 2 (d) 5

(7) The quadratic equation whose roots are 4 and – 4 is .....

(a) $X^2 - 16 = 0$ (b) $X^2 + 16 = 0$ (c) $X^2 + 2 = 0$ (d) $X^2 - 2 = 0$

(8) The function $f(X) = X^2 - 9$ is negative at $X \in$ .....

(a) $\mathbb{R}$ (b) $]-3 , 3[$ (c) $]-\infty , -3[$ (d) $]3 , \infty[$

(9) The angle of measure 1000° lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(10) If $\tan X = 1$, where X is a positive acute angle , then the measure of angle X = ...°

(a) 30 (b) 45 (c) 60 (d) 75

(11) If $\sin \theta > 0$, $\cos \theta < 0$, then θ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(12) $\sin 30° + \cos 60° - \cot 45°$ = ...

(a) 0 (b) 1 (c) 2 (d) 3

(13) If $\sin\theta = \cos 2\theta$, $0° < \theta < 90°$, then θ = ...°

(a) 45 (b) 30 (c) 60 (d) 75

(14) The range of the function $f(\theta) = \cos\theta$ is .....

(a) $[-1, 1]$ (b) $\{-1, 1\}$ (c) $]-\infty, \infty[$ (d) $\varnothing$

(15) The two similar polygons are congruent if the scale factor K satisfies .....

(a) $K > 1$ (b) $K = 1$ (c) $K < 1$ (d) $K = 0.5$

(16) If $\Delta ABC \sim \Delta XYZ$, $m(\angle A) = 50°$, $m(\angle B) = 60°$, then $m(\angle Z)$ = ...°

(a) 50 (b) 60 (c) 70 (d) 110

(17) If $\Delta ABC \sim \Delta DEF$, AB = 3 cm. , DE = 6 cm. , EF = 8 cm. , then BC = ... cm.

(a) 4 (b) 3 (c) 2 (d) 17

(18) If the ratio between the perimeters of two similar polygons is 3 : 4 , then the ratio between their areas is .....

(a) 3 : 4 (b) 4 : 3 (c) 9 : 16 (d) 5 : 6

(19) If $\Delta ABC \sim \Delta XYZ$, 2 AB = 3 XY , then area of ΔABC : area of ΔXYZ = ...

(a) 9 : 4 (b) 4 : 9 (c) 2 : 3 (d) 3 : 2

(20) If the ratio between the corresponding sides of two similar triangles is 2 : 5 if the area of the first triangle is 16 cm^2 , then the area of the second triangle = ... cm^2

(a) 40 (b) 80 (c) 100 (d) 120

(21) If the ratio between the areas of two similar polygons is 16 : 25 , then the ratio between their two corresponding sides = ...

(a) 2 : 5 (b) 4 : 5 (c) 16 : 25 (d) 4 : 25

(22) ΔABC in which $D \in \overline{AB}$, $E \in \overline{AC}$, $\overline{DE} \parallel \overline{BC}$, AD = 2 cm. , DB = 4 cm. and AE = 3 cm. , then EC = ... cm.

(a) 2 (b) 3 (c) 4 (d) 6

(23) ΔABC in which $D \in \overline{BC}$, $\overrightarrow{AD}$ bisects $\angle BAC$, AB = 4 cm. , AC = 8 cm. and BD = 3 cm. , the CD = ... cm.

(a) 3 (b) 4 (c) 6 (d) 8

(24) ΔABC in which $D \in \overline{BC}$, $\overrightarrow{AD}$ bisects $\angle BAC$, AB = 8 cm. , AC = 6 cm. BD = 4 cm. and CD = 3 cm. , then AD = ... cm.

(a) 6 (b) 8 (c) 10 (d) 12

(25) The measure of the angle included between the interior and the exterior bisectors at any vertex of angles of the triangle = ...°

(a) 30 (b) 45 (c) 60 (d) 90

(26) If M is a circle of radius length 3 cm. , A is a point lies in its plane where MA = 4 cm. , then $P_M(A)$ = ...

(a) 16 (b) 9 (c) 7 (d) 25

(27) If M is a circle , A is a point lies in its plane where $P_M(A) = 0$, then the point A lies ..... the circle M.

(a) outside (b) inside (c) on (d) on the centre

Second Essay questions

Answer the following questions :

1 Find in $\mathbb{R}$ the solution set of the inequality : $x^2 - 5x + 6 < 0$

2 ABCD is a quadrilateral in which AB = 6 cm. , BC = 9 cm. , CD = 6 cm. , AD = 4 cm. , $\overrightarrow{AE}$ bisects $\angle A$ and intersects $\overline{BD}$ at E , **prove that :** $\overrightarrow{CE}$ bisects $\angle BCD$

5 Giza Governorate — Awseem Educational Directorate

First Multiple choice questions

Interactive tests (5)

Choose the correct answer from the given ones :

(1) The conjugate of the number (2 i – 1) is .....

(a) 2 i + 1 (b) – 2 i – 1 (c) – 2 i + 1 (d) 2 i – 1

(2) The angle whose measure is 735° in the standard position is equivalent to the angle whose measure is .....°

(a) 15 (b) 753 (c) – 245 (d) 385

(3) The ratio between the lengths of two corresponding sides of two similar polygons is 3 : 5 , then the ratio between their surface areas is .....

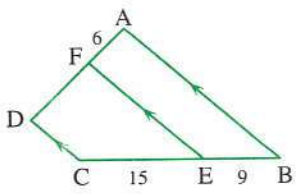
(a) 3 : 5 (b) 5 : 3 (c) 9 : 25 (d) 25 : 9

(4) In the opposite figure :

AD = ...

(a) 10 (b) 16

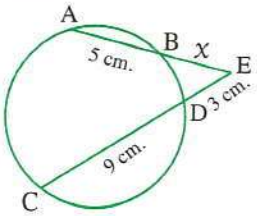
(c) 24 (d) 4



(5) The quadratic equation whose roots are 4i , – 4i is .....

(a) $x^2 = 16$ i (b) $x^2 - 16 = 0$ (c) $x^2 + 16 = 0$ (d) x^2 i + 16 = 0

(6) In the opposite figure :

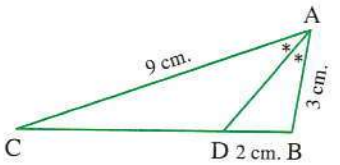


x = ...

(a) 3 (b) 4

(c) 5 (d) 6

(7) In the opposite figure :



CD = ... cm.

(a) 6 (b) 4.9

(c) 5 (d) 4.5

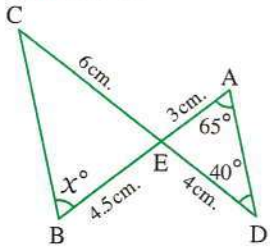
(8) 3 cos 30° tan 60° – 2 sec 45° csc 45° = ...

(a) 2 (b) $\frac{1}{2}$ (c) zero (d) 1

(9) The function $f(x) = 2x - 1$ is positive when .....

(a) $x > \frac{1}{2}$ (b) $x < \frac{1}{2}$ (c) $x = \frac{1}{2}$ (d) $x > 2$

(10) In the opposite figure :



x = ...°

(a) 40 (b) 75

(c) 65 (d) 25

(11) If L is a root of the equation : $3x^2 + 4x - 7 = 0$

, then the value of $3L^2 + 4L$ = ...

(a) zero (b) – 7 (c) 14 (d) 7

(12) If the ratio between the lengths of two corresponding sides in two similar polygons is 3 : 4 and the perimeter of the smaller is 15 cm. , then the perimeter of the bigger is ..... cm..

(a) 20 (b) $\frac{80}{3}$ (c) 27 (d) $\frac{25}{4}$

(13) The measure of the angle between the interior and the exterior bisectors of an angle of a triangle = ...°

(a) 45 (b) 90 (c) 135 (d) 180

(14) The arc of length 2π in a circle of radius length 8 cm. is opposite to a central angle of radian measure = ...

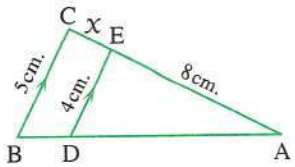
(a) 4π (b) 2π (c) π (d) $\frac{\pi}{4}$

(15) The solution set of the inequality : $x^2 - 5x + 7 < 0$ in $\mathbb{R}$ is .....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-4, 7[$ (d) $\mathbb{R} - [-4, 7]$

(16) In the opposite figure :

x = ... cm.



(a) 10 (b) 2

(c) 6 (d) 9

(17) If the power of point A with respect to circle M is positive then point A lies ..... the circle.

(a) in the center of (b) on (c) inside (d) outside

(18) The two roots of the equation : $16x^2 - 8x + 1 = 0$ are .....

(a) real different (b) complex non-real

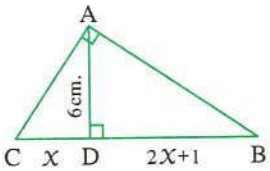
(c) real equal (d) complex and conjugate

(19) If $\sin\theta < 0$ and $\cos\theta > 0$ the angle whose measure is θ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(20) In the opposite figure :

x = ...

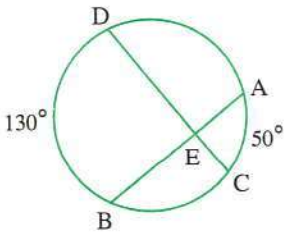


(a) 4.5 (b) 4

(c) 6 (d) 36

(21) In the opposite figure :

m (∠ DEB) = ...°



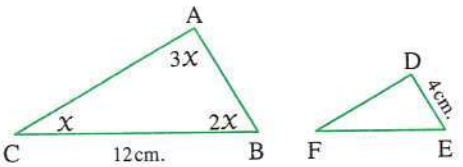
(a) 100 (b) 90

(c) 110 (d) 120

(22) In the opposite figure :

If $\Delta ABC \sim \Delta DEF$

, then EF = ...



(a) 4 (b) 2 (c) 8 (d) 12

(23) If L and M are the two roots of the equation : $x^2 + x + 1 = 0$

, then L + M + LM = ...

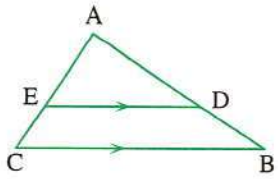
(a) zero (b) 1 (c) – 1 (d) 2

(24) If $\cos(270° - \theta) = \frac{1}{2}$ where θ is the measure of the smallest positive angle

, then θ = ...°

(a) 30 (b) 150 (c) 210 (d) 330

(25) In the opposite figure :



If $\frac{AD}{DB} = \frac{5}{3}$, then $\frac{AC}{EC}$ = ...

(a) $\frac{3}{5}$ (b) $\frac{3}{8}$

(c) $\frac{8}{3}$ (d) $\frac{5}{3}$

(26) $\frac{\sin 40°}{\cos 50°} + \frac{\tan 35°}{\cot 55°}$ = ...

(a) zero (b) 1 (c) – 1 (d) 2

(27) The function $f(x) = a x^2 + b x + c$ has one sign in $\mathbb{R}$ when .....

(a) $b^2 - 4ac < 0$ (b) $b^2 - 4ac = 0$

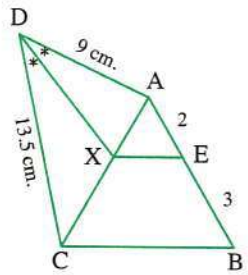
(c) $b^2 - 4ac \geq 0$ (d) $b^2 - 4ac > 0$

Second Essay questions

Answer the following questions :

1 Find the S.S. in $\mathbb{R}$ for the inequality : $x^2 - 4x - 12 > 0$

2 In the opposite figure :



ABCD is a quadrilateral in which $\overrightarrow{DX}$ bisects ∠ D

AE : EB = 2 : 3

, AD = 9 cm. , DC = 13.5 cm.

Prove that : $\overline{EX} \parallel \overline{BC}$

6 Alexandria Governorate

El-Gomrok Educational Directorate
Mathematics Supervision

First Multiple choice questions

Interactive tests 6

Choose the correct answer from the given ones :

(1) $(1 + i)^8$ = ...

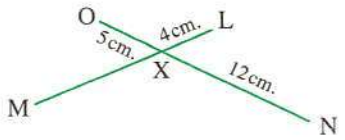
(a) 16 (b) 16 i (c) – 16 (d) – 16 i

(2) The ratio between two corresponding sides of two similar triangles is 4 : 5 and sum of their two areas is 410 cm^2 , then the difference their areas = ... cm^2

(a) 90 (b) 80 (c) 50 (d) 20

(3) In the opposite figure :

The points L , M , N , O lying on the same circle if XM = ... cm.



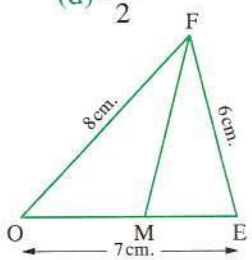
(a) 10 (b) 12 (c) 15 (d) 20

(4) If $\tan(90° + \mathcal{X}) = \sin 390° \cos(-60°) + \cos 30° \sin 120°$, then $\tan \mathcal{X}$ = ...

(a) -1 (b) 0.5 (c) 1 (d) $\frac{\sqrt{3}}{2}$

(5) In the opposite figure :

length of $\overline{MO}$ = ... cm.



(a) 3 (b) 4

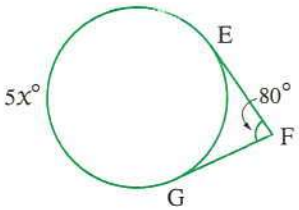
(c) 5 (d) 6

(6) If the product of two root of the equation : $L\mathcal{X}^2 + m\mathcal{X} + c = 0$ equal zero , then ..... = zero

(a) L (b) m (c) c (d) L + m

(7) In the opposite figure :

$\mathcal{X}$ = ...°



(a) 250 (b) 160

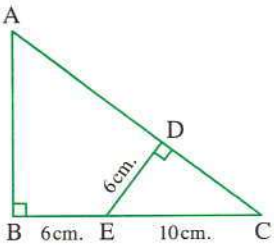
(c) 52 (d) 16

(8) Measure of the central angle opposite to an arc its length 4 π cm. in a circle its circumference 24 π cm. equals .....°

(a) 30 (b) 60 (c) 120 (d) 180

(9) In the opposite figure :

AD = ... cm.



(a) 15 (b) 9.6

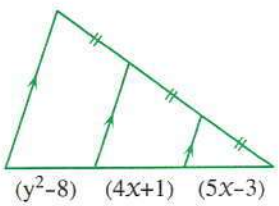
(c) 12 (d) 4

(10) S.S. of $\mathcal{X}^2 + 1 < 0$ in $\mathbb{R}$ is .....

(a) $\mathbb{R}$ (b) $\mathbb{R} - [-1 , 1]$ (c) $[-1 , 1]$ (d) $\varnothing$

(11) In the opposite figure :

$y > 0$, $\mathcal{X}\, y$ = ...



(a) 9 (b) 12

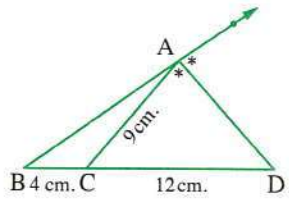
(c) 20 (d) 30

(12) If $\sec 2\theta = \csc 4\theta$, θ is acute angle , then $\tan 3\theta =$ .....

(a) 1 (b) $\frac{1}{2}$ (c) -1 (d) zero

(13) In the opposite figure :

AD = ... cm.



(a) $2\sqrt{21}$ (b) 15

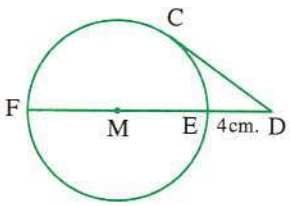
(c) $2\sqrt{15}$ (d) 6

(14) If the product of the two roots of the equation : $2x^2 + 7kx + 4k = 0$ equals the sum of the two roots of the equation : $x^2 - (k+4)x = 0$, then k = ...

(a) 1 (b) 2 (c) 3 (d) 4

(15) In the opposite figure :

If $P_M(D) = 36$, then the circumference of the circle M equals ..... cm.



(a) π (b) 5π

(c) 10π (d) 36π

(16) The two roots of $7x^2 + 14x + c = 0$ real different when $c \in$ .....

(a) $\mathbb{R}$ (b) $]7, \infty[$ (c) $[7, \infty[$ (d) $]-\infty, 7[$

(17) Ratio between two areas of two similar polygons 16 : 25 length of side of smaller one is 4 cm. , then the length of the corresponding side in greater one is ..... cm.

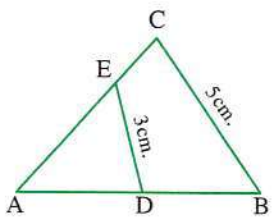
(a) 25 (b) 16 (c) 5 (d) $\frac{16}{25}$

(18) The maximum value of function $f(x) = \sin\left(\frac{\pi}{4} + x\right)$ when $x =$ .....

(a) $\frac{-\pi}{2}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) zero

(19) In the opposite figure :

$\Delta ADE \sim \Delta ACB$ are of $\Delta ADE = 90$ cm^2 , then area of BCED = ... cm^2



(a) 20 (b) 50

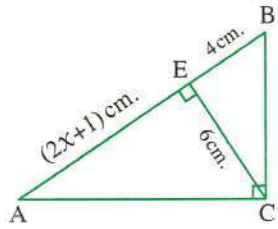
(c) 160 (d) 250

(20) If θ is an angle in standard position and its terminal side cuts the unit circle in $\left(\frac{2}{3}, \frac{\sqrt{5}}{3}\right)$, then $\cos(90 - \theta) + \cot(2\pi - \theta) =$ .....

(a) 1 (b) zero (c) $\frac{-\sqrt{5}}{3}$ (d) $\frac{-\sqrt{5}}{15}$

(21) In the opposite figure :

x = ... cm.



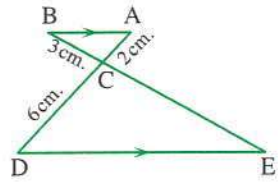
(a) 2 (b) 4

(c) 6 (d) 8

(22) If L is one of the two roots of the equation : $x^2 - 3x - 28 = 0$, then $L^2 - 3L$ =.....

(a) – 56 (b) 28 (c) 8 (d) 56

(23) In the opposite figure :



EC = ... cm.

(a) 2 (b) 3

(c) 9 (d) 10

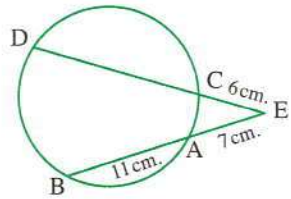
(24) The general solution of $\tan 3\theta = \cot 2\theta$ is .....

(a) $\frac{\pi}{10} + \frac{\pi}{5} n$ (b) $\frac{\pi}{5} + \pi n$ (c) $\frac{\pi}{10} + \frac{2\pi}{5} n$ (d) $\frac{\pi}{2} + \pi n$

(25) $f(x) = 4x - 3 - x^2$ is non-negative when $x \in$.....

(a) $\{1 , 3\}$ (b) $\mathbb{R} - \{1 , 3\}$ (c) $[1 , 3]$ (d) $\mathbb{R} - [1 , 3]$

(26) In the opposite figure :



CD = ... cm.

(a) 12 (b) 13

(c) 14 (d) 15

(27) The quadratic equation which one of its two roots equals i is .....

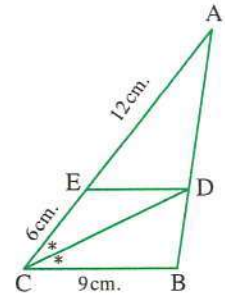
(a) $x^2 - 2 = 0$ (b) $x^2 + 1 = 0$ (c) $2 - x^2 = 0$ (d) $1 - x^2 = 0$

Second Essay questions

Answer the following questions :

1 If $\frac{2}{L}$, $\frac{2}{m}$ two roots of the equation : $4x^2 + 3x - 2 = 0$, form equation its two roots L , M

2 In the opposite figure :



$\overrightarrow{DC}$ bisects $\angle ACB$

, AE = 12 cm.

, CE = 6 cm.

, BC = 9 cm.

Prove that : $\overline{DE} // \overline{BC}$

7 El-Kalyoubia Governorate

Mathematics Supervision

First Multiple choice questions

Interactive tests (7)

Choose the correct answer from the given ones :

(1) If one of the two roots of : $x^2 - (k - 5)x + 10 = 0$ is additive inverse of the other , then K = ...

(a) 5 (b) 2 (c) -2 (d) -5

(2) The function $f(x) = 2x - 6$ is positive in the interval .....

(a) $]-\infty , 3[$ (b) $]-\infty , 2[$ (c) $]2 , \infty[$ (d) $]3 , \infty[$

(3) The quadratic equation whose two roots are $(2 + i)$, $(2 - i)$ is ..... (where $i^2 = -1$)

(a) $x^2 - 2x + 2 = 0$ (b) $x^2 + 2x + 2 = 0$

(c) $x^2 - 4x + 5 = 0$ (d) $x^2 + 4x + 5 = 0$

(4) $i + i^2 + i^3 + i^4 + \cdots + i^{2023}$ = ... where $i^2 = -1$

(a) i (b) $-i$ (c) 1 (d) -1

(5) If the roots of the equation : $x^2 - 4x + k = 0$ are real , then .....

(a) $k \geq 4$ (b) $k \leq 4$ (c) $k > 4$ (d) $k < 4$

(6) If $x - 2 - 10i = 5 - 3yi + 2i$, then $x + y$ = ...

(a) -3 (b) 3 (c) 10 (d) 11

(7) The solution set of the inequality : $x^2 - 6x + 9 < 0$ in $\mathbb{R}$ is .....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-\infty , 3[$ (d) $]3 , \infty[$

(8) If L and M are the two roots of the equation : $x^2 - 6x + 1 = 0$, then numerical value of $(L - 1)(M + 1)(L - 5)(M - 7)$ = ...

(a) 40 (b) 1 (c) -32 (d) -40

(9) The smallest positive measure of the angle $-750°$ = ... in radian.

(a) $\frac{5\pi}{6}$ (b) $\frac{7\pi}{6}$ (c) $\frac{11\pi}{6}$ (d) $\frac{13\pi}{6}$

(10) The minimum value of the function $f(x) = 2 \sin 3x$ is .....

(a) -3 (b) -2 (c) 2 (d) 3

(11) The measure of the central angle which drawn in a circle its radius 10 cm. and subtended arc of length 2π = ...°

(a) 30 (b) 36 (c) 45 (d) 60

(12) The directed angle in standard position which has terminal side intersects the unit circle at the point (a , b) where $a > 0$ and $b < 0$, then its lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(13) If $14\theta = \pi$, then the numerical value of $\frac{\cos 3\theta}{\sin 4\theta} + \frac{\tan \theta}{\cot 6\theta} + \frac{\cos 5\theta}{\cos 9\theta}$ = ...

(a) -3 (b) 0 (c) 1 (d) 3

(14) If $\tan 25° = k$, then $\frac{\cot 205° + \cot 295°}{1 + \tan 335°}$ = ...

(a) $\frac{1}{k} - 1$ (b) $1 + \frac{1}{k}$ (c) $1 - k^2$ (d) $k^2 - k$

(15) Two congruent polygons their scale factor is k , then .....

(a) $k < 1$ (b) $k > 1$ (c) $k = 1$ (d) $0 < k < 1$

(16) Two similar polygons , the ratio between two corresponding sides is 2 : 3 , then the ratio between their areas = ...

(a) 2 : 3 (b) 3 : 2 (c) 4 : 6 (d) 4 : 9

(17) The interior and exterior bisectors of an angle of triangle include between them an angle of measure .....°

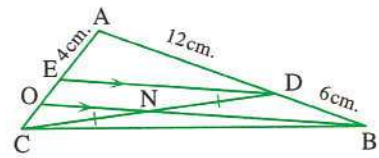
(a) 60 (b) 90 (c) 120 (d) 150

(18) **In the opposite figure :**

$\overline{DE} \parallel \overline{BO}$ and N is the midpoint of $\overline{DC}$

, AD = 12 cm. , DB = 6 cm. , AE = 4 cm.

, then the length of $\overline{OC}$ = ... cm.



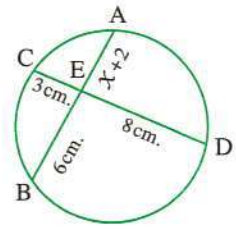
(a) 5 (b) 4 (c) 3 (d) 2

(19) **In the opposite figure :**

$\overline{AB} \cap \overline{CD} = \{E\}$, CE = 3 cm.

, EB = 6 cm. , ED = 8 cm. , then AE = $x + 2$ cm.

, then x = ...



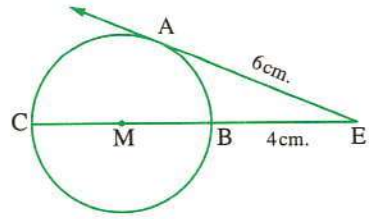
(a) 4 (b) 3 (c) 2 (d) 1

(20) **In the opposite figure :**

$\overline{EA}$ is a tangent to the circle at A

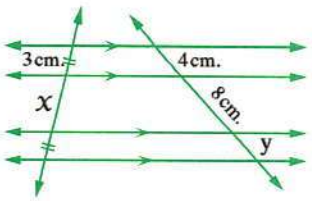
, AE = 6 cm. , EB = 4 cm.

, then the circumference of the circle = ... π



(a) 5 (b) 6 (c) 10 (d) 15

(21) In the opposite figure :

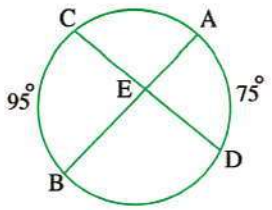


$\frac{x}{y}$ = ...

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$

(c) 1 (d) $\frac{3}{2}$

(22) In the opposite figure :



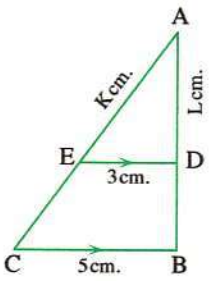
$\overline{AB} \cap \overline{CD} = \{E\}$

, then m (∠ AED) = ...°

(a) 85 (b) 80

(c) 75 (d) 60

(23) In the opposite figure :



$\overline{DE}$ // $\overline{BC}$, AD = L cm.

, AE = k cm. , DE = 3 cm. , BC = 5 cm.

, where L + k = 9 cm.

, then the perimeter of Δ ABC = ... cm.

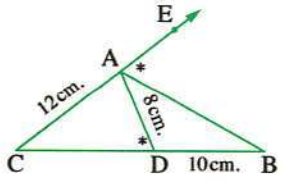
(a) 12 (b) 15 (c) 20 (d) 24

(24) A circle has radius length 10 cm. , A is a point in its plane where AM = 10 cm.

, then $P_M(A)$ = ...

(a) 0 (b) 25 (c) 75 (d) 100

(25) In the opposite figure :



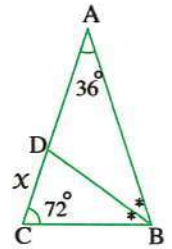
m (∠ ADC) = m (∠ BAE)

, then the length of $\overline{AB}$ = ... cm.

(a) 9 (b) 12

(c) 15 (d) 16

(26) In the opposite figure :



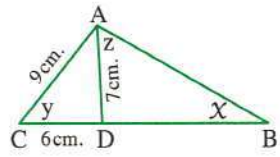
If the length of $\overline{CD}$ = x cm.

, BC = 2 cm. and $\overline{BD}$ bisects ∠ B

, then $x^2 + 2x$ = ...

(a) 2 (b) 4 (c) 6 (d) 8

(27) In the opposite figure :



If $z = x + y$

, then the length of $\overline{BD}$ = ... cm.

(a) 12 (b) 15 (c) 18 (d) 21

Second Essay questions

Answer the following questions :

1 If L and M are the roots of the equation : $x^2 - 5x + k = 0$ and $3L + 2M = 7$

Find : the value of k

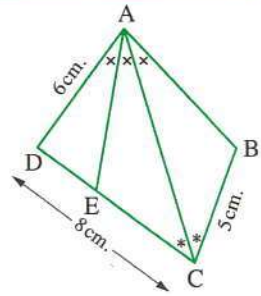
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2 **In the opposite figure :**

$AD = 6$ cm. , $CD = 8$ cm.

and $BC = 5$ cm. , where $E \in \overline{CD}$

Find : the length of $\overline{CE}$, $\overline{AC}$, $\overline{AE}$



8 El-Monofia Governorate

El-Sadat Educational Directorate
Mathematics Supervision

First Multiple choice questions

Interactive tests (8)

Choose the correct answer from the given ones :

(1) The simplest form of the imaginary number i^{39} is .....

(a) – 1 (b) 1 (c) – i (d) i

(2) If the two roots of the equation : $x^2 - kx + 25 = 0$ are real equal , then k = ...

(a) – 10 (b) 10 (c) 5 (d) ± 10

(3) If L and M are the roots of the equation : $x^2 - 3x + 5 = 0$, then the value of $L^2 + M^2$ = ...

(a) – 2 (b) 3 (c) 5 (d) – 1

(4) If one of the two roots of the equation : $x^2 - (k + 3)x + 4 = 0$ is the additive inverse of the other root , then k = ...

(a) – 4 (b) 3 (c) 4 (d) – 3

(5) If L and M are the roots of the equation : $\mathcal{X}^2 - 5\mathcal{X} + 7 = 0$, then the value of the expression : $\frac{12}{L^2 - 5L + 4}$ = ...

(a) – 11 (b) – 3 (c) – 4 (d) – 2

(6) The sign of function $f : f(\mathcal{X}) = -\mathcal{X} + 3$ positive if $\mathcal{X} \in$ .....

(a) $]\infty , 3]$ (b) $]-\infty , 3]$ (c) $]\infty , 3[$ (d) $]-\infty , 3[$

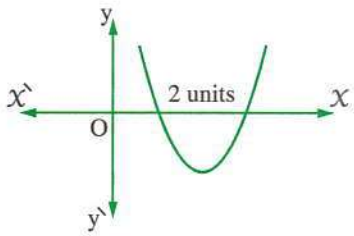
(7) The solution set of the inequality : $\mathcal{X}(\mathcal{X} - 1) > 0$ in $\mathbb{R}$ .....

(a) $\{0 , 1\}$ (b) $[0 , 1]$ (c) $\mathbb{R} -]0 , 1[$ (d) $\mathbb{R} - [0 , 1]$

(8) The opposite figure represents the curve of the function

$f : f(\mathcal{X}) = \mathcal{X}^2 - 8\mathcal{X} + k + 1$

, then k = ...



(a) 14 (b) – 14

(c) 8 (d) – 8

(9) The angle with measure – 120 in standard position lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(10) The measure of the central angle in a circle of radius length 15 cm. and opposite to an arc of length 5 π cm. equal .....

(a) 30° (b) 60° (c) 90° (d) 180°

(11) If $\theta \in]0 , \frac{\pi}{2}[$, $\cos\theta = \frac{3}{5}$, then $\csc\theta \sin\theta - \tan\theta \csc\theta$ = ...

(a) 0 (b) 1 (c) $\frac{-3}{2}$ (d) $\frac{-2}{3}$

(12) If $\tan\theta = \cot 2\theta$, $0° < \theta < 90°$, then $\sin\theta + \cos 2\theta$ = ...

(a) 1 (b) – 1 (c) 2 (d) $\frac{1}{4}$

(13) The range of the function $f : f(\mathcal{X}) = 4 \sin 2\mathcal{X}$ where $\mathcal{X} \in [0 , 2\pi]$ is .....

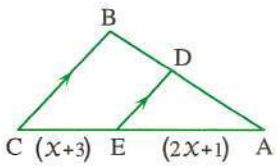
(a) $]-2 , 2[$ (b) $[-2 , 2]$ (c) $]-4 , 4[$ (d) $[-4 , 4]$

(14) $\cos(270 - \theta) + \sin(180 - \theta)$ = ...

(a) $2\sin\theta$ (b) $2\cos\theta$ (c) 0 (d) 1

(15) In the opposite figure :

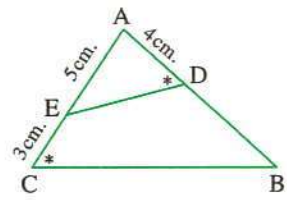
If AD : AB = 3 : 5 , then $\mathcal{X}$ = ...



(a) 5 (b) 3

(c) 4 (d) 7

(16) In the opposite figure :



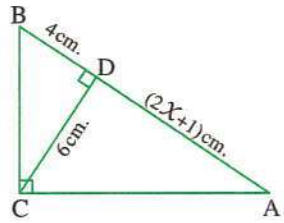
If m (∠ C) = m (∠ ADE)

, then DB = ... cm.

(a) 4 (b) 5

(c) 6 (d) 7

(17) In the opposite figure :



x = ...

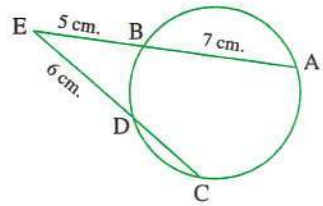
(a) 4 (b) 8

(c) 6 (d) 4.8

(18) The ratio between the lengths of two corresponding sides of two similar polygon is 5 : 3 and the difference between their areas is 32 cm^2 , then the area of the smaller polygon is ..... cm^2

(a) 18 (b) 50 (c) 32 (d) 16

(19) In the opposite figure :

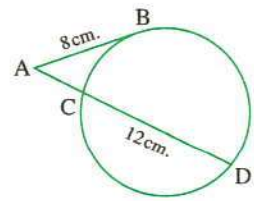


CD = ... cm.

(a) 4 (b) 5

(c) 6 (d) 3

(20) In the opposite figure :



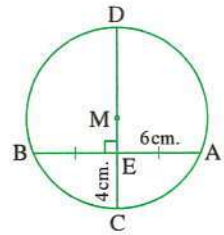
$\overline{AB}$ is a tangent to the circle. If CD = 12 cm. , AB = 8 cm.

, then AC = ... cm.

(a) 8 (b) 12

(c) 6 (d) 4

(21) In the opposite figure :



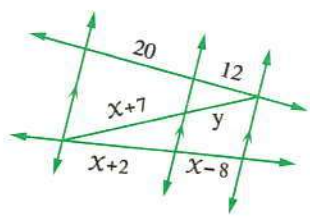
$\overline{CD}$ is a diameter

, AE = 6 cm. , CE = 4 cm.

, then the radius length of the circle M = ... cm.

(a) 9 (b) 4.5 (c) 6 (d) 6.5

(22) In the opposite figure :

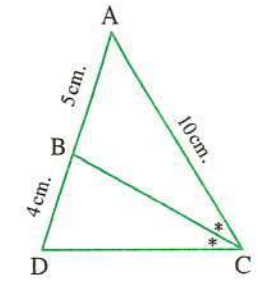


$x + y$ = ...

(a) 23 (b) 18

(c) 41 (d) 51

(23) In the opposite figure :



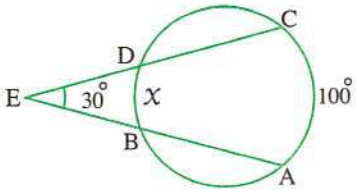
$\overrightarrow{CB}$ bisects $\angle ACD$

CB = ... cm.

(a) 8 (b) $4\sqrt{2}$

(c) $2\sqrt{15}$ (d) 6

(24) In the opposite figure :



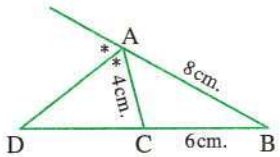
$m(\overset{\frown}{AC}) = 100°$

, then the value of X = ...

(a) 30° (b) 40°

(c) 50° (d) 60°

(25) In the opposite figure :

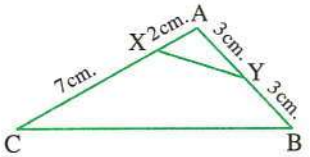


CD = ... cm.

(a) 2 (b) 4

(c) 6 (d) 8

(26) In the opposite figure :



The area of $\Delta ABC = 45$ cm^2

, then the area of ΔAYX = ... cm^2

(a) 22.5 (b) 90

(c) 5 (d) 15

(27) If A is a point on the plane of circle M of diameter = 12 cm. and AM = 10 cm.

, then $P_M(A)$ = ...

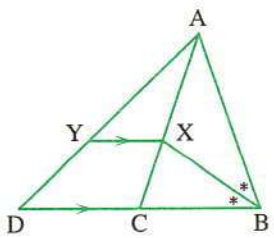
(a) 8 (b) – 8 (c) 64 (d) – 64

Second Essay questions

Answer the following questions :

1 If L , M are the roots of the equation : $X^2 - 2X + 5 = 0$, find the equation whose roots are L + 3 , M + 3

2 **In the opposite figure :**



AB = AC , BC = CD

$\overrightarrow{BX}$ bisects $\angle ABC$

, $\overline{XY} \parallel \overline{BD}$

Prove that : $\overrightarrow{CY}$ bisect $\angle ACD$

9 El-Gharbia Governorate — Central Mathematics Supervision

First Multiple choice questions

Interactive tests (9)

Choose the correct answer from the given ones :

(1) The solution set of the equation : $x^2 + 9 = 0$ in the set of complex numbers is .....

(a) $\{3i, -3i\}$ (b) $\varnothing$ (c) $\{3, -3\}$ (d) $\{3i\}$

(2) If the roots of the equation $m x^2 - 12x + 9 = 0$ are equal , then m = ...

(a) 16 (b) 4 (c) 2 (d) 9

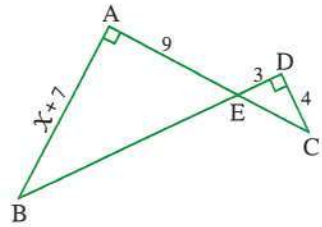
(3) **In the opposite figure :**

$\overline{BA} \perp \overline{AC}$ and $\overline{CD} \perp \overline{DB}$

, AB = $x + 7$, AE = 9 cm.

, ED = 3 cm. , DC = 4 cm.

, then x = ... cm.



(a) 9 (b) 3 (c) 4 (d) 5

(4) The simplest form of i^{42} is .....

(a) $-i$ (b) -1 (c) i (d) 1

(5) If 2 and -3 are the roots of the equation : $2x^2 + bx + c = 0$, then b – c = ...

(a) 10 (b) – 14 (c) – 10 (d) 14

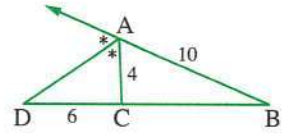
(6) If one of the roots of the equation : $x^2 - (k - 3)x + 5 = 0$ is the additive inverse of the other , then k = ...

(a) 5 (b) – 5 (c) 3 (d) – 3

(7) **In the opposite figure :**

$\overrightarrow{AD}$ bisects $\angle BAC$ externally

, then BD = ... cm.



(a) 10 (b) 9

(c) 15 (d) 4

(8) The function $f : f(x) = x^2 - x + 12$ is positive in the interval .....

(a) $\mathbb{R} - [-3, 4]$ (b) $]-3, 4[$ (c) $\mathbb{R} - \{3\}$ (d) $]-\infty, \infty[$

(9) If the polygon ABCD is similar to the polygon XYZL and XY = 3 AB , if the perimeter of ABCD is 20 cm. , then the perimeter of XYZL = ... cm.

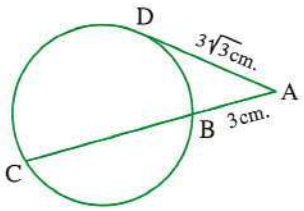
(a) 30 (b) 60 (c) 90 (d) 120

(10) In the opposite figure :

$\overline{AD}$ is a tangent of length $3\sqrt{3}$ cm.

, AB = 3 cm.

, then BC = ... cm.

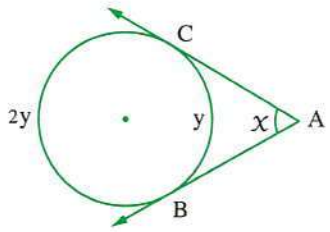


(a) 9 (b) 7

(c) 6 (d) 2

(11) In the opposite figure :

cos (y – χ) = ...



(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{-\sqrt{3}}{2}$

(c) $\frac{1}{2}$ (d) $\frac{-1}{2}$

(12) The terminal side of an angle θ in standard position intersects the unit circle at point B $\left(\chi , \frac{3}{5}\right)$ where $\chi < 0$, then sin (90° + θ) = ...

(a) – 0.8 (b) – 0.6 (c) 0.8 (d) 0.6

(13) The simplest form of the expression : tan (90° + θ) + tan (90° – θ) is .....

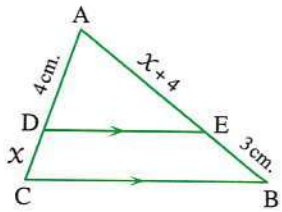
(a) 2 cot θ (b) 2 tan θ (c) zero (d) tan θ + cot θ

(14) The measure of the central angle which opposite to an arc of length π cm. in a circle whose radius length 4 cm. = ...

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$ (c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{8}$

(15) In the opposite figure :

$\overline{DE}$ // $\overline{BC}$, then χ = ...



(a) 3 (b) 4

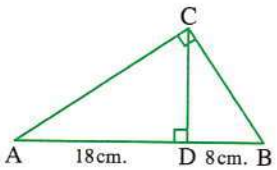
(c) 2 (d) 6

(16) If sin (2 χ) = cos (4 χ) , where χ is an acute angle , then tan (90° – 3 χ) = ...

(a) – 0.5 (b) 0.5 (c) 1 (d) – 1

(17) In the opposite figure :

CD = ... cm.



(a) $3\sqrt{13}$ (b) $6\sqrt{13}$

(c) $4\sqrt{13}$ (d) 12

(18) The function f : $f(\chi) = \chi^2 - 5\chi + 6$ has two different signs in interval .....

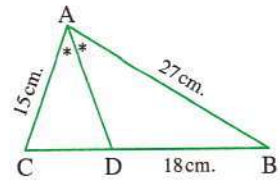
(a) [2 , 3] (b) [0 , 2] (c) [3 , 5 $\frac{1}{2}$] (d) [1 , 2 $\frac{1}{2}$]

(19) The solution set of the inequality : $x^2 - 5x - 6 \leq 0$ in $\mathbb{R}$ is .....

(a) $[-1, 6]$ (b) $]-1, 6[$ (c) $\mathbb{R} - [-1, 6]$ (d) $\mathbb{R} -]-1, 6[$

(20) In the opposite figure :

AD = ... cm.



(a) 27 (b) 18

(c) 15 (d) 20

(21) The angle of measure $\frac{5}{6}\pi$ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(22) The range of the function f : $f(x) = 5 \sin(3x)°$ is .....

(a) $[-5, 5]$ (b) $[-3, 3]$ (c) $[1, 3]$ (d) $[3, 5]$

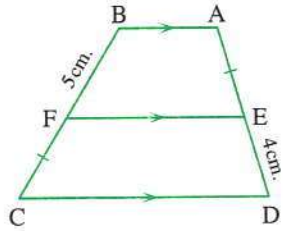
(23) If M is a circle of radius length 3 cm. , A is a point on its plane where MA = 5 cm. , then $P_M(A)$ = ...

(a) – 25 (b) – 16 (c) 25 (d) 16

(24) In the opposite figure :

$\overline{AB} // \overline{EF} // \overline{DC}$, AE = FC , BF = 5 cm.

and ED = 4 cm. , then AE = ... cm.



(a) 2 (b) $2\sqrt{5}$

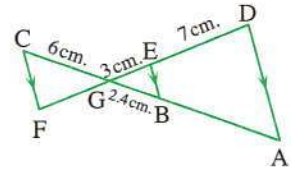
(c) $5\sqrt{2}$ (d) 20

(25) In the opposite figure :

$\overline{AD} // \overline{BE} // \overline{CF}$, $\overline{AC} \cap \overline{DF} = \{G\}$

EG = 3 cm. , CG = 6 cm. , BG = 2.4 cm.

and ED = 7 cm. , then GF = ... cm.



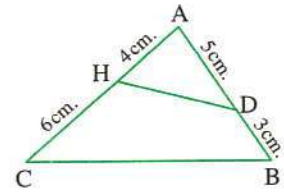
(a) 7.5 (b) 8.5 (c) 9 (d) 10

(26) In the opposite figure :

AD = 5 cm. , BD = 3 cm. , AH = 4 cm. , HC = 6 cm.

, the area of the triangle AHD = 16 cm^2

, then the area of the figure DBCH = ... cm^2



(a) 64 (b) 48 (c) 36 (d) 24

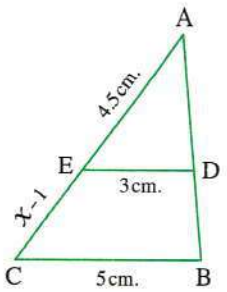
(27) In the opposite figure :

$\Delta AED \sim \Delta ACB$, ED = 3 cm.

, BC = 5 cm.

, AE = 4.5 cm.

, then find the value of x .....



(a) 3.5 (b) 4 (c) 8.5 (d) 4.5

Second Essay questions

Answer the following questions :

1 If $\frac{3}{L}$ and $\frac{3}{M}$ are the two roots of the equation : $x^2 - 6x + 9 = 0$

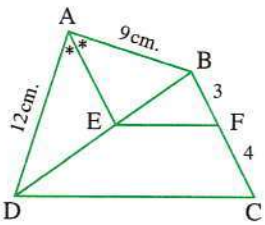
, then find the equation whose roots are L and M

2 **In the opposite figure :**

AB = 9 cm. , AD = 12 cm.

, $\overrightarrow{AE}$ bisects $\angle BAD$ and BF : FC = 3 : 4

Prove that : $\overline{FE} // \overline{CD}$



10 El-Dakahlia Governorate Maths Supervision

First Multiple choice questions

Interactive tests 10

Choose the correct answer from the given ones :

(1) The simplest form of the imaginary number i^{45} is .....

(a) i (b) – 1 (c) – i (d) 1

(2) The discriminant of the quadratic equation $2x^2 + 5x + 4k = 0$ equal to zero

, then the value of k = ...

(a) ± 14 (b) zero (c) $\pm \frac{25}{32}$ (d) $\frac{25}{32}$

(3) In the quadratic equation $ax^2 - bx + c = 0$, if the sum of the roots equal the product of them , then b = ...

(a) – a (b) a (c) – c (d) c

(4) The quadratic equation whose roots are 3 , – 5 is .....

(a) $x^2 + 2x - 15 = 0$ (b) $x^2 - 2x + 15 = 0$

(c) $x^2 - 2x - 15 = 0$ (d) $x^2 + 2x + 15 = 0$

(5) The sign of the function $f : f(x) = 6 - 2x$ is non-positive at .....

(a) $x > 3$ (b) $x \leq 3$ (c) $x < 3$ (d) $x \geq 3$

(6) The solution set of the inequality : $x^2 + 49 < 0$ in $\mathbb{R}$ is .....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $[-7, 7]$ (d) $\mathbb{R} - [-7, 7]$

(7) All function defined by the following rules are positive on $\mathbb{R}$ except .....

(a) $f(x) = 3$ (b) $f(x) = x + 3$

(c) $f(x) = x^2 - 3x + 3$ (d) $f(x) = x^2 + x + 3$

(8) L , M are two roots of the equation $x^2 - 7x + 3 = 0$, then the equation whose two roots (L + M) , (LM) is .....

(a) $x^2 - 10x + 21 = 0$ (b) $x^2 - 21x + 10 = 0$

(c) $x^2 + 10x + 21 = 0$ (d) $x^2 - 21x - 10 = 0$

(9) If θ is the smallest positive measure of a directed angle , then its negative measure is .....

(a) $-\theta$ (b) $\theta - 180$ (c) $\theta - 360°$ (d) $360°$

(10) The angle of measure $\frac{31\pi}{6}$ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(11) If $\cos\theta > 0$, $\sin\theta = -\frac{\sqrt{3}}{2}$, then a directed angle θ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(12) If $\sin(2\theta) = \cos(4\theta)$, where θ is a positive acute angle , then $\tan(90° - 3\theta) =$ .....

(a) -1 (b) $\frac{1}{\sqrt{3}}$ (c) 1 (d) $\sqrt{3}$

(13) The range of the function $f : f(x) = \frac{\cos x}{5}$ where $x \in \mathbb{R}$ is .....

(a) $[-\frac{1}{5}, \frac{1}{5}]$ (b) $[-1, 1]$ (c) $[-5, 5]$ (d) $[0, \frac{2}{5}]$

(14) If the terminal side of a directed angle θ in the standard position intersect the unit circle at $\left(-\frac{\sqrt{3}}{2}, y\right)$ where $y \in \mathbb{Z}^+$, then $\theta =$ .....°

(a) 30 (b) 150 (c) 210 (d) 330

(15) If $\Delta ABC \sim \Delta DEF$, $BC = 3\,EF$, then the scale factor of similarity of two triangles = ...

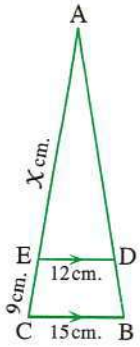
(a) $\frac{2}{3}$ (b) $\frac{1}{2}$ (c) 1 (d) 3

(16) In the opposite figure :

x = ... cm.

(a) 12 (b) 24

(c) 36 (d) 48



(17) If $\Delta ABC \sim \Delta DEF$, a $(\Delta ABC) = 9$ a (ΔDEF) and $DE = 4$ cm. , then AB = ... cm.

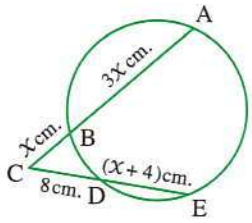
(a) $\frac{4}{3}$ (b) 12 (c) 9 (d) 36

(18) In the opposite figure :

x = ... cm.

(a) 3 (b) 5

(c) 6 (d) 9

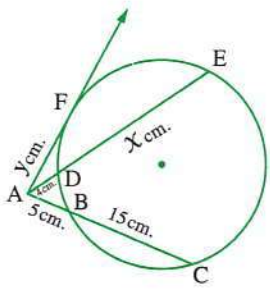


(19) In the opposite figure :

$x + y$ = ... cm.

(a) 9 (b) 18

(c) 22 (d) 31

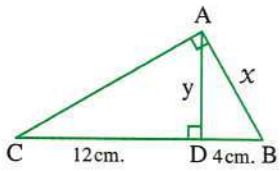


(20) In the opposite figure :

(x , y) = ...

(a) $\left(4\sqrt{3} , 8\right)$ (b) $\left(8 , 4\sqrt{3}\right)$

(c) $\left(4\sqrt{3} , 4\sqrt{3}\right)$ (d) $(8 , 8)$



(21) Two similar polygons , the ratio between their perimeters equal 4 : 9 , then the ratio between the lengths of two corresponding sides is .....

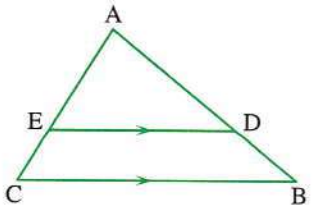
(a) 4 : 9 (b) 2 : 3 (c) 16 : 81 (d) 9 : 4

(22) In the opposite figure :

All the following statments must be true except .....

(a) $\frac{AD}{BD} = \frac{AE}{EC}$ (b) $\frac{AD}{BA} = \frac{DE}{BC}$

(c) $\frac{AD}{BD} = \frac{AE}{AC}$ (d) $\frac{AB}{BD} = \frac{AC}{EC}$

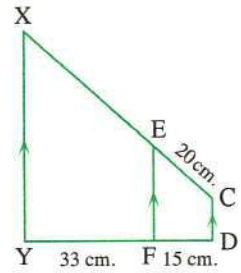


(23) In the opposite figure :

$\overline{CD} // \overline{EF} // \overline{XY}$, CE = 20 cm.

, DF = 15 cm. , FY = 33 cm.

, then CX = ... cm.

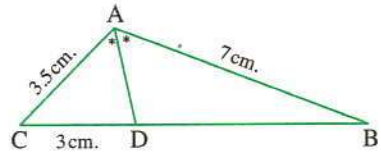


(a) 48 (b) 64

(c) 44 (d) 21

(24) In the opposite figure :

BD = ... cm.

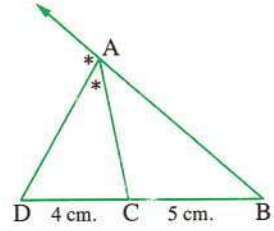


(a) 4.5 (b) 5

(c) 4.9 (d) 6

(25) In the opposite figure :

AB : AC = ...

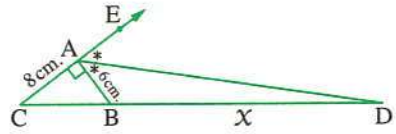


(a) 5 : 4 (b) 5 : 9

(c) 9 : 5 (d) 9 : 4

(26) In the opposite figure :

x = ... cm.



(a) 7.5 (b) 10

(c) 30 (d) 40

(27) If $P_M(A) = r$, where r is radius of the circle , then the point A lies .....

(a) outside the circle. (b) inside the circle.

(c) on the circle. (d) on the center of the circle.

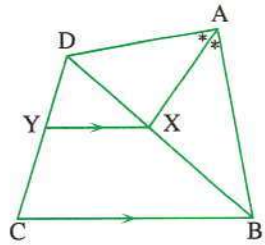
Second Essay questions

Answer the following questions :

1 Find in $\mathbb{R}$ the solution set of the inequality : $x^2 - 3x - 4 \leq 0$

2 In the opposite figure :

Prove that : $\frac{DY}{YC} = \frac{AD}{AB}$



11 Damietta Governorate — Damietta Eductional Directorate

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The two similar polygons are congruent if the scale factor k satisfies .....

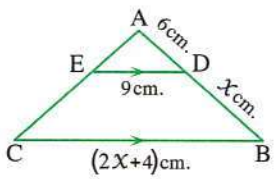
(a) $k = 0.5$ (b) $k = 1$ (c) $k > 1$ (d) $0 < k < 1$

(2) **In the opposite figure :**

If $\overline{DE} \parallel \overline{BC}$, ED = 9 cm.

and AD = 6 cm.

, then x = ... cm.



(a) 10 (b) 30 (c) 3 (d) 24

(3) $\sqrt{-2} \times \sqrt{-8}$ = ...

(a) 4 (b) – 4 (c) 4 i (d) – 4 i

(4) The ratio between two corresponding sides of two similar squares is 3 : 4 , if the area of the greate square is 48 cm^2 , then the area of the smaller one = ... cm^2

(a) 16 (b) 12 (c) 20 (d) 27

(5) All the following are measures of angles lying in the second quadrant except .....°

(a) – 240 (b) 100 (c) – 120 (d) 860

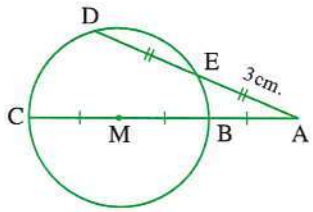
(6) If the curve of the quadratic equation $f : f(x) = x^2 - 2(m - 2)x + m^2 - 8$ touches the x-axis , then m = ...

(a) 2 (b) 3 (c) 4 (d) 5

(7) **In the opposite figure :**

If circle M in which , AE = 3 cm.

, then CM = ... cm.



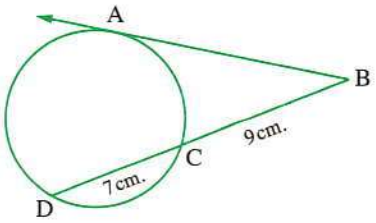
(a) $\sqrt{3}$ (b) 9

(c) $2\sqrt{6}$ (d) $\sqrt{6}$

(8) **In the opposite figure :**

$\overrightarrow{BA}$ is a tangent , BC = 9 cm. , CD = 7 cm.

, then AB = ... cm.



(a) $\frac{9}{16}$ (b) 12

(c) 144 (d) 63

(9) If M , $\frac{2}{M}$ are the roots of the equation : a x^2 + b x + 12 = 0 , then a = ...

(a) 9 (b) 6 (c) 5 (d) 3

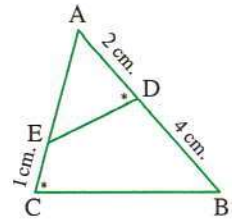
(10) In the opposite figure :

If m (∠ ADE) = m (∠ C)

, AD = 2 cm. , DB = 4 cm.

and EC = 1 cm.

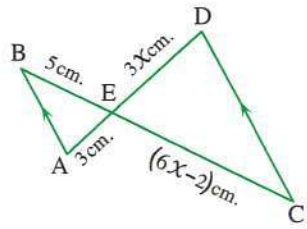
, then AE = ... cm.



(a) 5 (b) 4.5 (c) 3 (d) 4

(11) In the opposite figure :

If $\overline{AB}$ // $\overline{CD}$, then x = ...



(a) 6 (b) 4.5

(c) 3 (d) 2

(12) The circle of diameter length 12 cm. , the length of the arc subtended by a central angle of measure 60° equals ..... cm.

(a) 5 π (b) 4 π (c) 3 π (d) 2 π

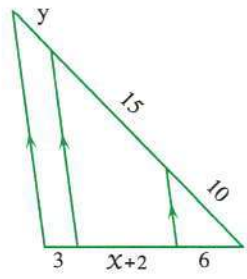
(13) If one of the two roots of the equation : (k – 3) x^2 – 5 x + 2 k = 8 is the multiplicative inverse of the other root , then the value of k = ...

(a) – 3 (b) – 5 (c) 3 (d) 5

(14) In the opposite figure :

If the given lengths in cm.

, then x + y = ... cm.



(a) 5 (b) 7

(c) 11 (d) 12

(15) The range of the function f : f (θ) = 3 cos 2 θ equal .....

(a) [– 2 , 2] (b) [– 3 , 3] (c)]– 3 , 3[(d)]– 2 , 2[

(16) If the terminal side of the angle whose measure θ drawn in the standard position intersect the unit circle at $\left(\frac{-3}{5}, \frac{4}{5}\right)$, then cot θ = ...

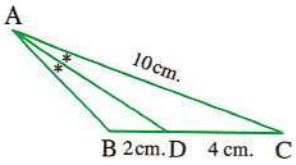
(a) $\frac{5}{4}$ (b) $\frac{-5}{3}$ (c) $\frac{-4}{3}$ (d) – 0.75

(17) In the opposite figure :

If $\overrightarrow{AD}$ is the interior bisector of $\angle$ BAC

, AC = 10 cm. , DC = 4 cm. , DB = 2 cm.

, then the length of $\overline{AD}$ = ... cm.



(a) 9 (b) 5 (c) $\sqrt{42}$ (d) $\sqrt{58}$

(18) The exterior bisector at the vertex of an isosceles triangle ..... to the base.

(a) parallel (b) perpendicular (c) bisects (d) equal

(19) The solution set of the inequality : $(x-2)(x+4) \leq 0$ in $\mathbb{R}$ is .....

(a) $\mathbb{R} - [-4, 2]$ (b) $\mathbb{R} -]-4, 2[$ (c) $]-4, 2[$ (d) $[-4, 2]$

(20) $\cos(90° - \theta) \times \csc\theta$ = ...

(a) zero (b) 1 (c) -1 (d) $\frac{-4}{5}$

(21) If M is a circle of radius length 3 cm. , A is a point lies in its plane where MA = 4 cm.

, then $P_M(A)$ = ...

(a) $\sqrt{7}$ (b) 9 (c) 7 (d) -7

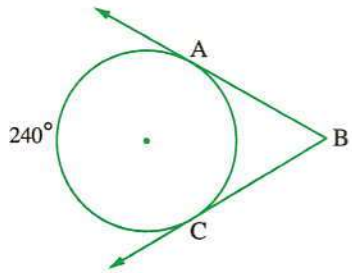
(22) In the opposite figure :

If $\overrightarrow{BA}$, $\overrightarrow{BC}$ are two tangents and m $(\overset{\frown}{AC}) = 240°$

, then m $(\angle B)$ = ... °

(a) 40 (b) 60

(c) 80 (d) 120



(23) $(3 + i)^2 = 6i +$ .....

(a) 4 (b) 6 (c) 8 (d) 10

(24) The sign of the function $f : f(x) = 6 - 2x$ is non positive at .....

(a) $x > 3$ (b) $x \leq 3$ (c) $x < 3$ (d) $x \geq 3$

(25) If $\sin\theta = \frac{-1}{2}$ where θ is measure of the smallest positive angle , then θ = ...°

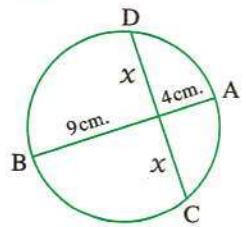
(a) -30 (b) 30 (c) 210 (d) 150

(26) In the opposite figure :

x = ...

(a) -6 (b) -18

(c) 18 (d) 6



(27) If $(1 + i^4)(1 - i^7) = x + y\,i$, then $x + y$ = ...

(a) 4 (b) 3 (c) 2 (d) 1

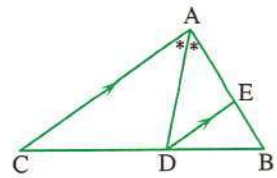
Second Essay questions

Answer the following questions :

1 **In the opposite figure :**

$\overrightarrow{AD}$ bisects $\angle BAC$ and $\overline{AC} // \overline{ED}$

Prove that : $\frac{BE}{EA} = \frac{BA}{AC}$



2 If L , M are the two roots of the equation : $x^2 - 5x + 9 = 0$

, find the equation whose roots L^2 , M^2

12 El-Beheira Governorate — El-Tahrir Eductional Directorate

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The conjugate of $2i + 5$ is = ...

(a) $2i - 5$ (b) $-2i - 5$ (c) $-2i + 5$ (d) $2i + 5$

(2) $\sqrt{-2} \times \sqrt{-32}$ = ...

(a) 8 (b) $8i$ (c) -8 (d) $8i$

(3) If the curve of the quadratic function $f(x)$ does not intersect the x-axis , then the discriminant of the equation $f(x)$ is .....

(a) > 0 (b) < 0 (c) $= 0$ (d) ≥ 0

(4) The sum of the two roots of the equation $bx^2 + cx + a = 0$ equals .....

(a) $\frac{-b}{a}$ (b) $\frac{-c}{a}$ (c) $\frac{-c}{b}$ (d) $\frac{a}{b}$

(5) If $3i$ is one root of the equation $x^2 + bx + c = 0$ where $b , c \in \mathbb{R}$, then $b + c$ = ...

(a) 9 (b) $9 + 6i$ (c) $9 - 6i$ (d) -9

(6) The quadratic equation whose two roots are 2 and 5 is .....

(a) $x^2 + 7x - 10 = 0$ (b) $x^2 - 7x + 10 = 0$

(c) $x^2 + 7x + 10 = 0$ (d) $x^2 - 7x - 10 = 0$

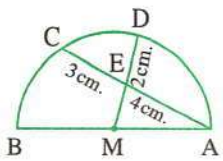
(7) If $f(x) = (x - 3)^2$, then $f(2) \times f(5) \in$ .....

(a) $\mathbb{R}^-$ (b) $\mathbb{R}^+$ (c) $\{2 , 5\}$ (d) $\{-1 , 2\}$

(8) The solution set of inequality $x^2 + a \leq 0$ is ..... where $a \in \mathbb{R}^+$

(a) $\mathbb{R}$ (b) $\varnothing$ (c) $\mathbb{R}^+$ (d) $\mathbb{R}^-$

(9) In the opposite figure :



ME = ... cm.

(a) 2 (b) 6

(c) 10 (d) 12

(10) The arc which its length 4 π cm. in a circle its radius length 12 cm. , opposite to central angle of measure .....

(a) $\frac{1}{2}\pi$ (b) $\frac{1}{3}\pi$ (c) $\frac{1}{4}\pi$ (d) $\frac{1}{6}\pi$

(11) If θ is the measure of angle lies in the third quadratic , then $\sin\theta \times \sec\theta$ 0

(a) = (b) < (c) > (d) $\leq$

(12) ABC is right angled triangle at B , $\sin A = \frac{3}{5}$, then $\sin(B + C)$ = ...

(a) $\frac{3}{5}$ (b) $\frac{-3}{5}$ (c) $\frac{4}{5}$ (d) $\frac{-4}{5}$

(13) The maximum value of the function $f : f(X) = 2 \sin 4X$ is .....

(a) 2 (b) 4 (c) 6 (d) 8

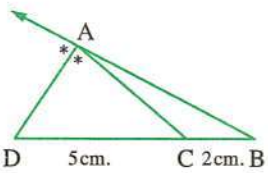
(14) If $\sec\theta = 2$, $\theta \in]270°, 360°[$, then θ = ...

(a) 60° (b) 120° (c) 240° (d) 300°

(15) If $\Delta ABC \sim \Delta XYZ$, $5AB = 3XY$ and the area of $\Delta ABC = 18$ cm^2 , then the area of ΔXYZ = ... cm^2

(a) 10 (b) 30 (c) 25 (d) 50

(16) In the opposite figure :

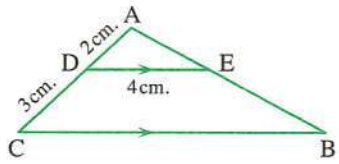


AB : AC = ...

(a) 2 : 5 (b) 7 : 5

(c) 2 : 7 (d) 3 : 5

(17) In the opposite figure :

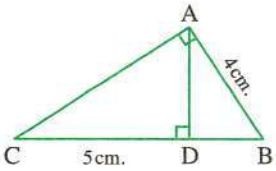


BC = ... cm.

(a) 6 (b) 8

(c) 10 (d) 12

(18) In the opposite figure :



$AC \times AD$ = ...

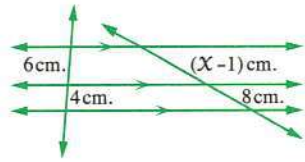
(a) 16 (b) 20

(c) 25 (d) 32

(19) If the ratio between the areas of two squares 4 : 9 , then the ratio between their primeters = ...

(a) 16 : 36 (b) 2 : 3 (c) 16 : 81 (d) 4 : 9

(20) In the opposite figure :



X = ...

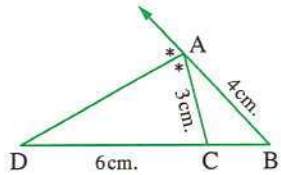
(a) 11 (b) 4

(c) 12 (d) 13

(21) If $P_M(A) = 7$, then A lies ..... the circle.

(a) outside (b) inside (c) on (d) at the center of

(22) In the opposite figure :

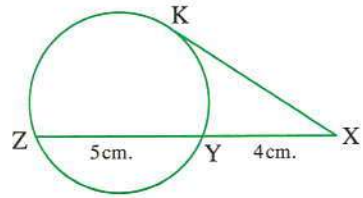


BC = ...

(a) 5 (b) 2

(c) 8 (d) 10

(23) In the opposite figure :

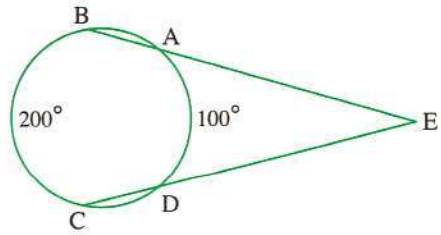


XK = ...

(a) 9 (b) 20

(c) 6 (d) 36

(24) In the opposite figure :



m (∠ E) = ...°

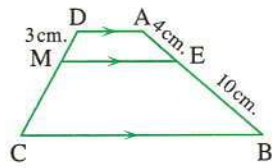
(a) 50 (b) 75

(c) 100 (d) 150

(25) The triangle which has two angles with measure 30° and 70° similar to the triangle which has two angles with measure 70° and .....°

(a) 80 (b) 100 (c) 60 (d) 40

(26) In the opposite figure :



MC = ... cm.

(a) 15 (b) 11

(c) 9 (d) 7.5

(27) The angle its measure is – 15° lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

Second Essay questions

Answer the following questions :

1 If L + 2 and M + 2 is the two roots of the quadratic equation $x^2 - 11x + 3 = 0$ form the equation whose roots are L and M

2 ABC is a right angled triangle at B , which AB = 12 cm. , AC = 20 cm. If $\overrightarrow{AD}$ bisect ($\angle$ BAC) and intersect $\overline{BC}$ in D , find the length of $\overline{CD}$

13 Beni Suef Governorate — Education Administration

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The quadratic equation whose roots are (1 + i) and (1 – i) is .....

(a) $x^2 + 2x + 2 = 0$ (b) $x^2 - 2x + 2 = 0$

(c) $x^2 + 2x - 2 = 0$ (d) $x^2 - 2x - 2 = 0$

(2) The simplest form of $(1 - i)^2$ of the expression is .....

(a) – 2 (b) – 2 i (c) 2 (d) 2 i

(3) The sign of the function : $f(x) = 6 - 3x$ has a positive sign if .....

(a) $x \geq 2$ (b) $x > 2$ (c) $x < 2$ (d) $x = 2$

(4) The solution set of the equation : $x^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) $\{\pm 3\}$ (b) $\{\pm 3i\}$ (c) $\{9\}$ (d) $\varnothing$

(5) If $x = 2$ is one of the two roots of the equation $x^2 + 2x + k = 0$, then k = ...

(a) – 8 (b) 0 (c) 2 (d) 8

(6) If the two roots of the equation $mx^2 - 12x + 9 = 0$ are complex numbers , then .....

(a) m > 4 (b) m = 4 (c) m < 4 (d) m = 1

(7) If $(2x - 1) + 5i = 3 + (y + 4)i$, then $x + y =$ .....

(a) 3 (b) 2 (c) 1 (d) 0

(8) If L and M are the two roots of the equation : $x^2 + 3x - 4 = 0$, then L + M = ...

(a) – 4 (b) – 3 (c) 3 (d) 4

(9) The radian measure of a central angle which subtended an arc of length 3 cm. of a circle whose diameter length equal 4 cm. is .....

(a) $\left(\frac{3}{4}\right)^{rad}$ (b) $\left(\frac{3}{2}\right)^{rad}$ (c) 6^{rad} (d) $\left(\frac{2}{3}\right)^{rad}$

(10) If $\mathcal{X}$ and y are two acute angles where $\tan \mathcal{X} = \cot y$, then $\cos (\mathcal{X} + y) =$ .....

(a) -1 (b) zero (c) 1 (d) undefined

(11) If $f(\mathcal{X}) = 3 \cos 5\mathcal{X}$, $\mathcal{X} \in \mathbb{R}$, then the minimum value of the function $f(\mathcal{X}) =$ .....

(a) -5 (b) -3 (c) 3 (d) 5

(12) All equilateral triangles are .....

(a) congruent. (b) similar.

(c) equal in area. (d) equal in perimeter.

(13) If $\sin A = -1$, $\cos A = 0$, then $A =$ .....°

(a) 0 (b) 90 (c) 180 (d) 270

(14) If $25 \cos \theta = 7$ where $\theta \in]\frac{3\pi}{2}, 2\pi[$, then $\tan \theta =$ .....

(a) $\frac{24}{7}$ (b) $\frac{7}{24}$ (c) $-\frac{24}{7}$ (d) $-\frac{7}{24}$

(15) If the ratio between the perimeters of two similar triangles is 4 : 9 , then the ratio between their two surface areas .....

(a) 4 : 9 (b) 2 : 3 (c) 16 : 81 (d) 9 : 4

(16) A rectangle has dimensions 4 cm. , 2 cm. , then the perimeter of another rectangle similar to it , if the scale factor of similarity equal 3 , is ..... cm.

(a) 4 (b) 18 (c) 24 (d) 36

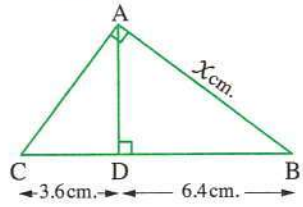
(17) $\sin (180° + A) \sec (270° + A) =$ .....

(a) $\tan A$ (b) $\cot A$ (c) $\cot 45°$ (d) $\tan 135°$

(18) If $\Delta ABC \sim \Delta XYZ$ and $AB = 3\,XY$, then $\frac{\text{Area of } (\Delta ABC)}{\text{Area of } (\Delta XYZ)} =$ .....

(a) $\frac{1}{9}$ (b) $\frac{1}{3}$ (c) 3 (d) 9

(19) In the opposite figure :

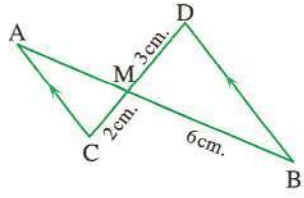


$\mathcal{X} =$ ..... cm.

(a) 4.8 (b) 6

(c) 8 (d) 10

(20) In the opposite figure :



$\overleftrightarrow{AC} \,//\, \overleftrightarrow{BD}$, $AM =$ ..... cm.

(a) 1 (b) 2

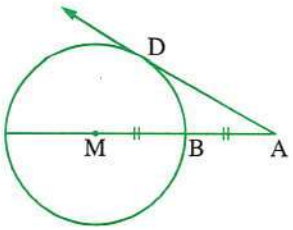
(c) 4 (d) 8

(21) If $P_M(A) = 0$, then A lies ..... the circle M

(a) on (b) inside (c) outside (d) on the centre of

(22) If $\overleftrightarrow{AD}$ is a tangent to circle M , AB = BM

AD = $2\sqrt{3}$ cm. , then AB = ...



(a) 2 (b) 4

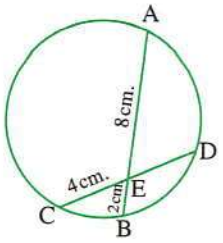
(c) 6 (d) 8

(23) In the opposite figure :

AE = 8 cm. , BE = 2 cm.

and CE = 4 cm.

, then DE = ...



(a) 2 (b) 4

(c) 6 (d) 8

(24) Any two regular polygons having the same number of sides are .....

(a) congruent. (b) similar.

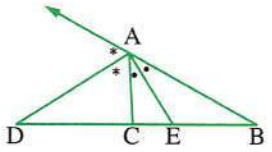
(c) equal in area. (d) equal in perimeter.

(25) In the opposite figure :

$\overrightarrow{AD}$ bisects the exterior angle at A

$\overrightarrow{AE}$ bisects the interior angle at A

, then m (∠ EAD) = ...°



(a) 30 (b) 45 (c) 60 (d) 90

(26) If Δ LMN ~ Δ XYZ and m (∠ L) = 35° , m (∠ Z) = 75° so m (∠ M) = ...°

(a) 35 (b) 70 (c) 75 (d) 110

(27) If the power of a point A with respect to the circle M of radius length 6 cm. is equals 64 cm. , then AM = ...

(a) 6 (b) 8 (c) 10 (d) 100

Second Essay questions

Answer the following questions :

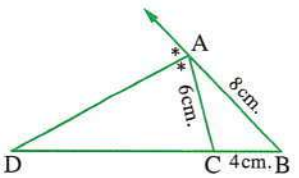
1 Determine the sign of the function : $f(X) = X^2 + 2X - 15$, then represent your answer on the number line.

2 **In the opposite figure :**

$\overrightarrow{AD}$ bisects the exterior angle at A

AB = 8 cm. , CB = 4 cm. and AC = 6 cm.

Find the length of $\overline{CD}$



14 El-Menia Governorate

Bani Mazar Administration
Math Department

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $\mathcal{X} = 3$ is one of the roots of the eqution $\mathcal{X}^2 - 7\,\mathcal{X} + k = 0$, then the value of k = ...

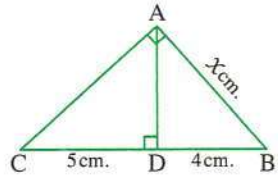
(a) 3 (b) 4 (c) – 12 (d) 12

(2) Solution set of the equation $\mathcal{X}^2 + 25 = 0$ in complex numbers is .....

(a) $\{5\}$ (b) $\{-5\}$ (c) $\{-5\,i\,,5\,i\}$ (d) $\varnothing$

(3) **In the opposite figure :**

$\mathcal{X}$ = ... cm.

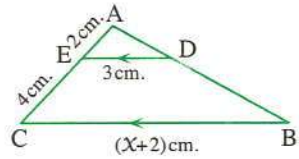


(a) 20 (b) 12

(c) 9 (d) 6

(4) **In the opposite figure :**

$\mathcal{X}$ = ... cm.



(a) 7 (b) 6

(c) 12 (d) 16

(5) The directed angle whose terminal side intersects the unit circle at $(\mathcal{X}\,,y)$ where $\mathcal{X} > 0$, $y < 0$ lie in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(6) Length of the arc of circle whose radius length 6 cm. and opposite central angle of measure 30° is equal to ..... cm.

(a) 6π (b) 4π (c) 2π (d) π

(7) If $(\mathcal{X} + 1) + (y - 2)\,i = 4 + 3\,i$, then $\mathcal{X} + y$ = ...

(a) 8 (b) 5 (c) 7 (d) 3

(8) If the two roots of the equation $\mathcal{X}^2 - 8\,\mathcal{X} + k = 0$ are equal real numbers , then the value of k = ...

(a) 8 (b) 16 (c) – 8 (d) – 16

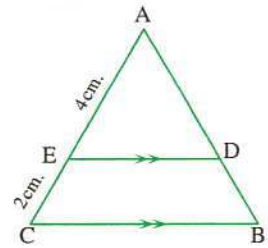
(9) **In the opposite figure :**

$\overline{DE} \,//\, \overline{BC}$, AE = 4 cm.

, EC = 2 cm.

, the area of Δ ADE = 12 cm^2

, then area of the trapezium DBCE is ..... cm^2

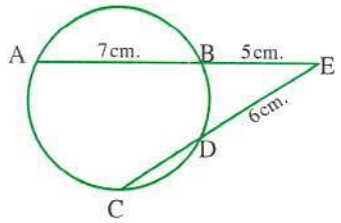


(a) 6 (b) 15 (c) 18 (d) 27

(10) In the opposite figure :

AB = 7 cm. , BE = 5 cm. , DE = 6 cm.

, the length of $\overline{CD}$ is ..... cm.



(a) 6 (b) 5

(c) 4 (d) 3

(11) sin (90 – θ) sec θ = ...

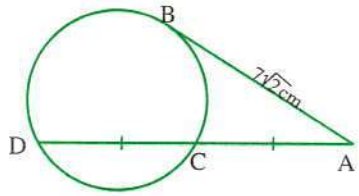
(a) – 1 (b) zero (c) 1 (d) $\sqrt{3}$

(12) In the opposite figure :

$\overline{AB}$ is a tangent segment of a circle at B

, C is midpoint of $\overline{AD}$, AB = $7\sqrt{2}$

, then the length of $\overline{AD}$ is ..... cm.



(a) 14 (b) 7 (c) $7\sqrt{2}$ (d) $14\sqrt{2}$

(13) If one of the roots of the equation $3\,\mathcal{X}^2 + 10\,\mathcal{X} + (m - 1) = 0$ is a multiplicative inverse of the other , then the value of m = ...

(a) 3 (b) 4 (c) – 4 (d) 10

(14) If L and M are two roots of the equation $\mathcal{X}^2 - 4\,\mathcal{X} + 3 = 0$, then $L^2 + M^2$ = ...

(a) 3 (b) 4 (c) – 10 (d) 10

(15) If $2 \sin \theta - \sqrt{3} = 0$, where $\theta \in]\frac{\pi}{2} , \pi[$, then θ = ...

(a) 135° (b) 60° (c) 150° (d) 120°

(16) The sign of the function $f : f(\mathcal{X}) = 8 - 2\,\mathcal{X}$ is positive if .....

(a) $\mathcal{X} > 4$ (b) $\mathcal{X} \geq 4$ (c) $\mathcal{X} < 4$ (d) $\mathcal{X} \leq 4$

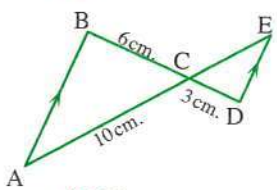
(17) If the ratio between areas of two similar polygon is 9 : 16 , then the ratio between its perimeter is .....

(a) 18 : 32 (b) 3 : 4 (c) 81 : 256 (d) 4 : 3

(18) In the opposite figure :

$\overline{AB}$ // $\overline{DE}$, CD = 3 cm. , AC = 10 cm. , BC = 6 cm.

, then the length of $\overline{CE}$ is ..... cm.



(a) 5 (b) 8 (c) 12 (d) 18

(19) If sin (2 θ) = cos (4 θ) , where θ is an acute positive angle , then tan (90 – 3 θ) = ...

(a) – 1 (b) zero (c) 1 (d) $\sqrt{2}$

(20) Solution set of an inequality $x^2 - 5x \leq -6$ in $\mathbb{R}$ is .....

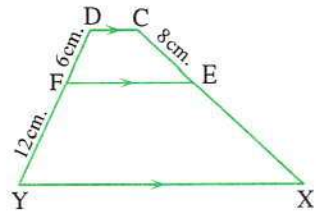
(a) $\mathbb{R} -]2, 3[$ (b) $\mathbb{R} - [2, 3]$ (c) $]2, 3[$ (d) $[2, 3]$

(21) **In the opposite figure :**

$\overline{CD} // \overline{FE} // \overline{XY}$, CE = 8 cm.

, DF = 6 cm. , FY = 12 cm.

, then the length of $\overline{XE}$ is ..... cm.



(a) 42 (b) 16 (c) 24 (d) 21

(22) If a function $f : f(\theta) = 3 \sin 2\theta$ is periodic and its period is .....

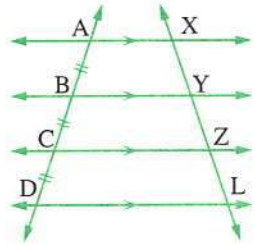
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) 2π (d) π

(23) **In the opposite figure :**

$\overleftrightarrow{AX} // \overleftrightarrow{BY} // \overleftrightarrow{CZ} // \overleftrightarrow{DL}$, $\overleftrightarrow{XL}$, $\overleftrightarrow{BC}$ are two transversal

, AB = BC = CD if YL = 10 cm.

, then XL = ... cm.



(a) 5 (b) 10

(c) 15 (d) 30

(24) The two bisectors of the interior and extrior angle at any vertex of a triangle make an angle of measure .....

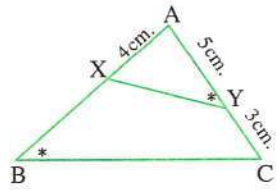
(a) 45° (b) 60° (c) 90° (d) 120°

(25) **In the opposite figure :**

In ΔABC : m ($\angle AYX$) = m ($\angle ABC$)

, AX = 4 cm. , AY = 5 cm. , YC = 3 cm.

, then the length of $\overline{XB}$ is ..... cm.



(a) 10 (b) 6 (c) 5 (d) 3

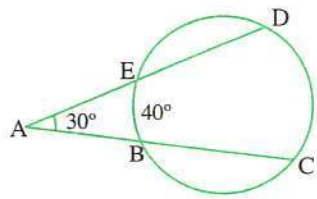
(26) A circle M whose radius length 5 cm. , if a point (A) in its plane , MA = 7 cm.

, then P_M (A) = ...

(a) 2 (b) 9 (c) 12 (d) 24

(27) **In the opposite figure :**

m ($\angle A$) = 30° , m ($\overset{\frown}{BE}$) = 40° , then m ($\overset{\frown}{DC}$) = ...°



(a) 100 (b) 70

(c) 40 (d) 30

Second Essay questions

Answer the following questions :

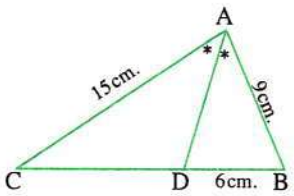
1 If L and M are two roots of the equation $X^2 - 3X + 5 = 0$

, then form the equation with the two roots $\frac{1}{L}$, $\frac{1}{M}$

2 **In the opposite figure :**

In Δ ABC : $\overrightarrow{AD}$ bisects ($\angle$ A)

, AB = 9 cm. , AC = 15 cm. , BD = 6 cm.



Find the length of :

(1) $\overline{CD}$ (2) $\overline{AD}$

15 Qena Governorate — Mathematics Supervision

محافظة قنا

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If one of two roots of the equations $(k - 2)X^2 + 3X + 6 = 0$ is multiplicative inverse of other , then k = ...

(a) – 2 (b) 2 (c) 8 (d) 6

(2) Two similar polygons the ratio between two corresponding sides is 1 : 3 , which of following is not correct ?

(a) Ratio between their perimeter equal 1 : 9

(b) Ratio between their surface areas equal 1 : 9

(c) Ratio between their corresponding angles equal 1

(d) Similarity factor equal 1 : 3

(3) Function f where $f(X) = 2$ is positive in the interval .....

(a) $[-2, 2]$ (b) $]-\infty, 2[$ (c) $]2, \infty[$ (d) $]-\infty, \infty[$

(4) If the ratio between the surface areas of two similar triangle is 1 : 4 , then the ratio between their perimeters equal .....

(a) 1 : 2 (b) 1 : 4 (c) 1 : 8 (d) 1 : 16

(5) If $2X - 3Y + (3Y + 1)i = 7 + 10i$, then XY = ...

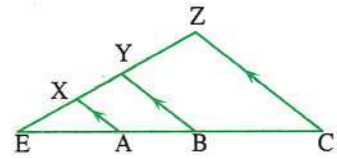
(a) 3 (b) 0 (c) 24 (d) 11

(6) In the opposite figure :

$\overline{AX} // \overline{BY} // \overline{CZ}$, EA = 6 cm. , EX = 4 cm.

XY = 3 cm. , BC = 7.5 cm.

, then AB + ZY = ... cm.



(a) 4.5 (b) 9.5 (c) 5 (d) 9

(7) General solution of equation tan (3 θ + 10) = cot (2 θ + 15) is .....

(a) $\theta = 13° + 90° n$ (b) $\theta = 13° + 72° n$

(c) $\theta = 13° + 36° n$ (d) $\theta = 13° - 90° n$

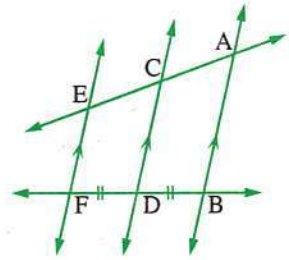
(8) In the opposite figure :

$\overline{AB} // \overline{CD} // \overline{EF}$, AC = (X – 3) cm.

, CE = (Y + 2) cm. , BD = (X + 3) cm.

, DF = (2 Y + 5) , BD = DF

, then X + Y = ...



(a) 3 (b) 8 (c) 5 (d) 11

(9) If the two roots of the equations : $X^2 - 6X + L = 0$ are two equal real numbers

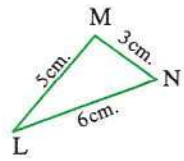
, then L = ...

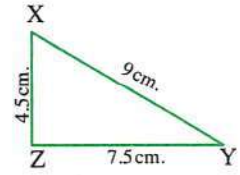
(a) 9 (b) 8 (c) – 9 (d) – 8

(10) In the opposite figure :

If the two triangles are similar

, then the similarity factor = ...





(a) $\frac{3}{4}$ (b) $\frac{3}{2}$ (c) $\frac{9}{10}$ (d) $\frac{9}{5}$

(11) If $\cos\theta = -\frac{\sqrt{3}}{2}$, $\sin\theta = \frac{1}{2}$, then θ = ...

(a) 30° (b) 150° (c) 210° (d) 120°

(12) (2 + i) (2 – i) = ...

(a) 4 (b) 3 (c) 5 (d) 2 i

(13) The degree measure for the central angle in a circle , where its radius 6 cm. , opposite to an arc its length of 3 π cm. , equals .....

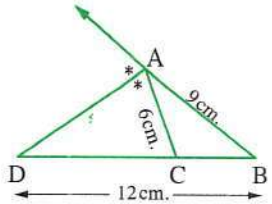
(a) 30° (b) 60° (c) 120° (d) 90°

(14) In the opposite figure :

$\overrightarrow{AD}$ bisects exterior angle for Δ ABC at vertex A

, AC = 6 cm. , BD = 12 cm. , AB = 9 cm.

, then BC = ... cm.



(a) 4 (b) 8 (c) 6 (d) 3

(15) If $f\ [-2\ ,4] \longrightarrow \mathbb{R}$ where $f(\mathcal{X}) = 2 - \mathcal{X}$, then sign of $f(\mathcal{X})$ is negative in the interval .....

(a) $]2\ ,4]$ (b) $]2\ ,4[$ (c) $[-2\ ,2]$ (d) $[-2\ ,2[$

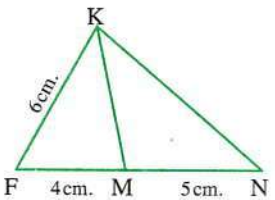
(16) Circle M , its radius r , if $P_M(B) = \frac{1}{2}$ r , then point B , lies .....

(a) inside circle. (b) outside circle.

(c) on circle. (d) on center circle.

(17) In the opposite figure :

Δ FMK ~ Δ .....

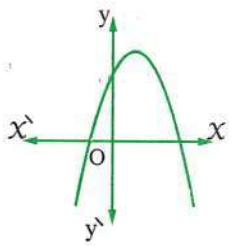


(a) NKM (b) FNK

(c) MNK (d) FKN

(18) The opposite figure represents the curve

$y = a\mathcal{X}^2 + b\mathcal{X} + c$, which of the following is correct ?



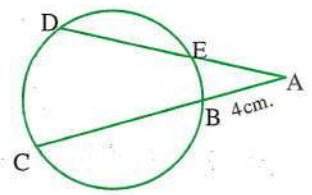
(a) $a > 0\ , c > 0$ (b) $a > 0\ , c < 0$

(c) $a < 0\ , c > 0$ (d) $a < 0\ , c < 0$

(19) In the opposite figure :

If AE = 3 cm. , DE = 13 cm. , AB = 4 cm.

, then BC = ... cm.



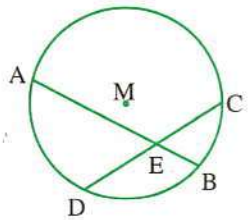
(a) 12 (b) 8

(c) 16 (d) 14

(20) In the opposite figure :

m $(\overset{\frown}{AC}) = 165°$, m $(\angle CEA) = 120°$

, then m $(\overset{\frown}{BD})$ = ...



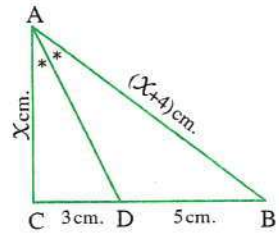
(a) 100° (b) $142°30\grave{}$

(c) 60° (d) 75°

(21) Angle with measure (– 850°) lies in ..... quadrant.

(a) first (b) second (c) third (d) fourth

(22) In the opposite figure :

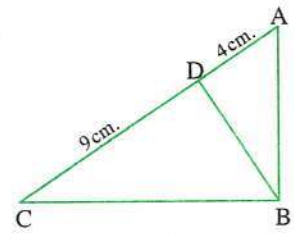


x = ...

(a) 6 (b) 5

(c) 4 (d) 3

(23) In the opposite figure :



If AD = 4 cm. , CD = 9 cm.

, then BD = ...

(a) 4 (b) 5

(c) 6 (d) 9

(24) If $15 \tan A = -8$, $90° < A < 180°$, then the value of :

$5 \sec (2\pi - A) + 4 \cot (2\pi - A)$ = ...

(a) $\frac{-581}{255}$ (b) $\frac{581}{255}$ (c) $\frac{-6}{11}$ (d) $\frac{11}{6}$

(25) Range of function f where $f(\theta) = 3 \sin 2\theta$ is .....

(a) $[-3 , 3[$ (b) $[-3 , 3]$ (c) $]-3 , 3]$ (d) $]-3 , 3[$

(26) Two similar rectangles , the first has length three times its wideth , if the second has length of 12 cm. , then its width = ... cm.

(a) 36 (b) 4 (c) 3 (d) 9

(27) If L and M are the two roots of the equation $x^2 + 2x + 5 = 0$, then the quadratic equation whose roots are L + 2 , M + 2 is .....

(a) $2x^2 + 2x + 5 = 0$ (b) $2x^2 + 2x - 5 = 0$

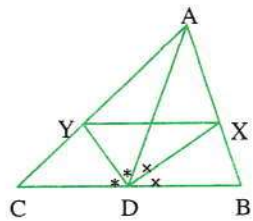
(c) $x^2 - 2x + 5 = 0$ (d) $x^2 - 2x - 5 = 0$

Second Essay questions

Answer the following questions :

1 Find in $\mathbb{R}$ the solution set of following inequality : $x^2 + 2x - 8 > 0$

2 In the opposite figure :



If $\overline{AD}$ median of Δ ABC

, $\overrightarrow{DX}$ bisect $\angle$ ADB

, $\overrightarrow{DY}$ bisect $\angle$ ADC

Prove that : $\overline{XY} // \overline{BC}$

حمل الآن

مجانا وحصريا

امتحانات رقم (3)

الترم الاول

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1 Cairo Governorate

El-Sherouk Zone
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First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $(1 + i^4)(1 - i^7) = x + y\,i$, then $x + y =$ .....

(a) -2 (b) 2 (c) 4 (d) 6

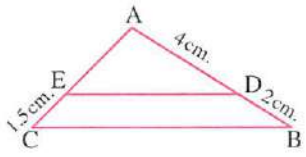
(2) If $\frac{2}{L}$ and $\frac{2}{M}$ are the roots of : $x^2 - 8x + 4 = 0$, then LM = ...

(a) -8 (b) -4 (c) 1 (d) 4

(3) If $\Delta ADE \sim \Delta ABC$

, AD = 4 cm. , AB = 6 cm.

and CE = 1.5 cm. , then AE = ... cm.



(a) 3 (b) 5 (c) 6 (b) 7

(4) If L and L^2 are the roots of : $x^2 - b\,x + 8 = 0$, then b = ...

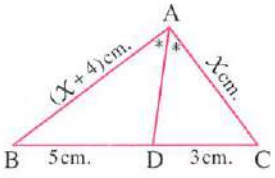
(a) 2 (b) 4 (c) 6 (d) 8

(5) In ΔABC , $\overrightarrow{AD}$ bisects $\angle CAB$

, AB = $(x + 4)$ cm. , AC = x cm.

and CD = 3 cm. , DB = 5 cm.

, then $x =$ .....



(a) 4 (b) 6 (c) 8 (d) 10

(6) If $\overrightarrow{AB}$ is tangent to the circle M at the point B and $P_M(A) = 25$ cm^2

, then AB = ... cm.

(a) 5 (b) 16 (c) 20 (d) 25

(7) The range of the function f : $f(x) = 4 \sin 3x$ is .....

(a) $]-4 , 4[$ (b) $[-4 , 4]$ (c) $\mathbb{R} -]-3 , 4[$ (d) $[-3 , 3]$

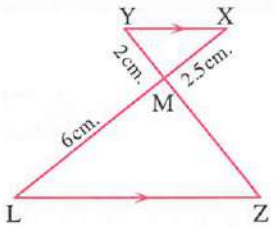
(8) If L and M are the roots of the equation : $x^2 + 3x + 3 = 0$, then the equation whose roots are LM and L + M is .....

(a) $x^2 + 9 = 0$ (b) $x^2 = 9$

(c) $x^2 - 3 = 0$ (d) $x^2 + 9x = 0$

(9) In the opposite figure :

If $\overline{LZ} \parallel \overline{YX}$, $\overline{YZ} \cap \overline{XL} = \{M\}$, XM = 2.5 cm. , YM = 2 cm. , LM = 6 cm. , then MZ = ... cm.



(a) 2.7 (b) 3.6

(c) 4.8 (d) 7.5

(10) The solution set of : $4 - x^2 \geq 0$ is .....

(a) $[-2 , 2]$ (b) $[4 , \infty[$

(c) $\mathbb{R} -]-2 , 2[$ (d) $\mathbb{R} - [-2 , 2]$

(11) The ratio between the lengths of two corresponding sides of two simillar polygons is 5 : 4 and the difference between thier areas is 27 cm^2 , then the area of the smaller polygon is ..... cm^2

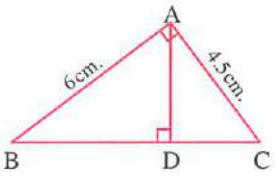
(a) 3 (b) 9 (c) 16 (d) 48

(12) $\sin(180° - \theta) \times \sec(270° + \theta)$ = ...

(a) $\tan\theta$ (b) $\csc\theta$ (c) 1 (d) – 1

(13) In the opposite figure :

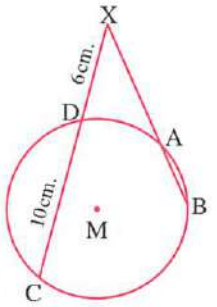
Δ ABC in which m ($\angle$ A) = 90° , $\overline{AD} \perp \overline{BC}$, AB = 6 cm. and AC = 4.5 cm. , then AD = ... cm.



(a) 2.7 (b) 3.6 (c) 4.8 (d) 7.5

(14) In the opposite figure :

M is a circle where $\overrightarrow{BA} \cap \overrightarrow{CD} = \{X\}$, if XA = 2 AB , XD = 6 cm. and CD = 10 cm. , then XB = ... cm.



(a) 4 (b) 8

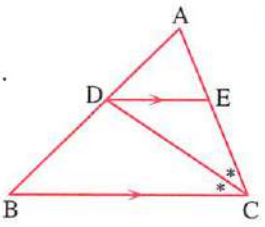
(c) 12 (d) 16

(15) The angle with measure 495° in standard position is equivalent to angle with measure .....

(a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{4}$ (c) $\frac{5\pi}{4}$ (d) $\frac{7\pi}{4}$

(16) In the opposite figure :

Δ ABC in which $\overline{BC} \parallel \overline{DE}$, $\overrightarrow{CD}$ bisects $\angle$ ACB , then $\frac{AE}{EC}$ = ...



(a) $\frac{AD}{AB}$ (b) $\frac{AD}{AE}$

(c) $\frac{AC}{CB}$ (d) $\frac{DE}{BC}$

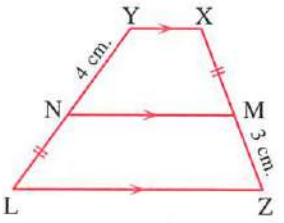
(17) The terminal side of angle θ in the standard position intersects the unit circle at the point $\left(\frac{\sqrt{5}}{3} , \frac{-2}{3}\right)$, then $\cos\left(\frac{\pi}{2} + \theta\right) + \sin(2\pi - \theta)$ = ...

(a) 0 (b) $\frac{4}{3}$ (c) $\frac{-4}{3}$ (d) $\frac{5}{3}$

(18) In the opposite figure :

If $\overline{LZ} \parallel \overline{YX} \parallel \overline{MN}$, XM = NL

, then MX = ... cm.



(a) 3 (b) $2\sqrt{3}$

(c) $3\sqrt{2}$ (d) 12

(19) The simplest form of i^{2022} = ...

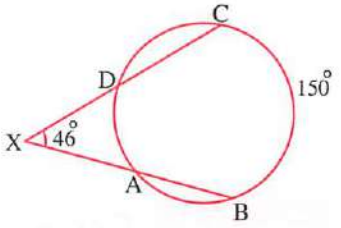
(a) $-i$ (b) -1 (c) i (d) 1

(20) In the opposite figure :

A circle in which $\overrightarrow{BA} \cap \overrightarrow{CD} = \{X\}$

, if m ($\angle$ X) = 46° and m $(\overset{\frown}{BC})$ = 150°

, then m $(\overset{\frown}{AD})$ = ...



(a) 58° (b) 92° (c) 103° (d) 196°

(21) The function $f : f(x) = (x - 1)(x + 4)$ is positive at $x \in$ .....

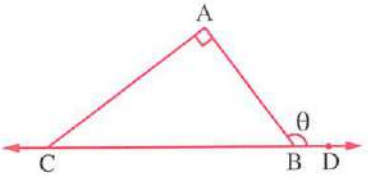
(a) $]-1 , 4[$ (b) $]-4 , 1[$

(c) $\mathbb{R} -]-4 , 1[$ (d) $\mathbb{R} - [-4 , 1]$

(22) If the two roots of the equation : $x^2 + 4x + k = 0$ are real different , then k = ...

(a) $]-\infty , 4[$ (b) $]4 , \infty[$ (c) $]-\infty , 4]$ (d) $\{4\}$

(23) In the opposite figure :



ABC is right-angled triangle at A , $D \in \overleftrightarrow{BC}$

if AB = 12 cm. , AC = 16 cm. , then $\tan\theta$ = ...

(a) $\frac{3}{4}$ (b) $\frac{-3}{4}$

(c) $\frac{4}{3}$ (d) $\frac{-4}{3}$

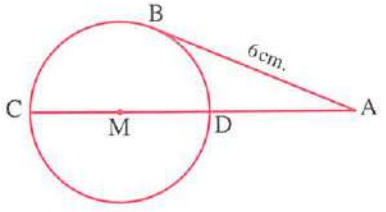
(24) If the two roots of the equation : $4x^2 - 20x + m = 0$ are equal , then m = ...

(a) 5 (b) 16 (c) 20 (d) 25

(25) If one of the two roots of : $x^2 - (b + 4)x - 9 = 0$ is additive inverse of the other , then b = ...

(a) – 4 (b) 0 (c) 4 (d) – 9

(26) $\overrightarrow{AB}$ is a tangent to M at B , AB = 6 cm.



If the radius is 2.5 , then AD = ... cm.

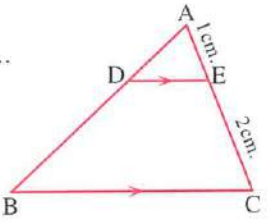
(a) 4 (b) 5

(c) 9 (d) 36

(27) If $\sin(\theta + 10°) = \cos(40°)$, where $\theta \in]\frac{\pi}{2} , \pi[$, then θ = ...

(a) 40° (b) 50° (c) 120° (d) 130°

(28) In the opposite figure :



Δ ABC in which $\overline{BC} // \overline{DE}$, then $\frac{\text{area of } \Delta \text{ ADE}}{\text{area of trapezium (BDEC)}}$ = ...

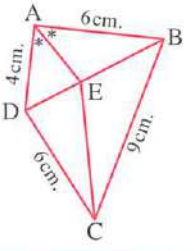
(a) $\frac{1}{2}$ (b) $\frac{1}{4}$

(c) $\frac{1}{9}$ (d) $\frac{1}{8}$

Second Essay questions

Answer the following questions :

1 In the opposite figure :



ABCD is a quadrilateral in which AB = 6 cm. , BC = 9 cm. , CD = 6 cm. and AD = 4 cm. If $\overrightarrow{AE}$ bisects $\angle$ A and intersects $\overline{BD}$ at E

Prove that : $\overrightarrow{CE}$ bisects $\angle$ BCD

2 $\overline{AB}$ is a diameter of a circle whose radius length is 12 cm. , the chord $\overline{AC}$ is draw such that m ($\angle$ BAC) = 50° , find the length of the arc $(\overset{\frown}{AC})$

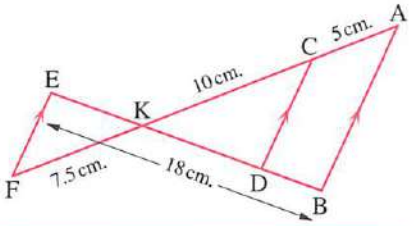
3 If L + 3 and M + 3 are the roots of the equation $x^2 - 12x + 3 = 0$ find the equation whose roots are L and M

4 **In the opposite figure :**

$\overline{BA} // \overline{DC} // \overline{EF}$, where AC = 5 cm.

, EB = 18 cm. , CK = 10 cm. and KF = 7.5 cm.

Find the length of $\overline{DB}$ and $\overline{KE}$



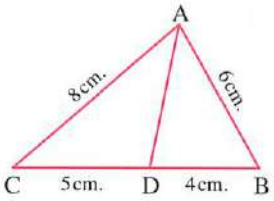
5 **In the opposite figure :**

ABC is a triangle in which $D \in \overline{BC}$ where BD = 4 cm.

, DC = 5 cm. , and AB = 6 cm.

, AC = 8 cm.

Prove that : $\Delta ABC \sim \Delta DBA$, then find AD



2 Cairo Governorate

Futures Language Schools
Mathematics department

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $x = 3$ is one root of the equation : $3x^2 - 8x + m = 0$, then m = ...

(a) 3 (b) – 3 (c) 5 (d) – 5

(2) The quadratic equation whose two roots are 8 , – 13 is .....

(a) $x^2 - 5x + 104 = 0$ (b) $x^2 - 5x - 104 = 0$

(c) $x^2 + 5x - 104 = 0$ (d) $x^2 + 5x + 104 = 0$

(3) The simplest form of the imaginary number i^{15} = ...

(a) i (b) – i (c) 1 (d) – 1

(4) The function $f : f(x) = 12 - 3x$ is negative on the interval .....

(a) $[-4 , \infty[$ (b) $]-\infty , 4[$ (c) $]4 , \infty[$ (d) $]-\infty , -4]$

(5) The expression (13 – 2 i) – (3 – i) in the form of the number a + b i is .....

(a) 10 i (b) – 10 i (c) 10 + i (d) 10 – i

(6) The two roots of the equation : $x^2 - 4x + k = 0$ are equal if k = ...

(a) 1 (b) 4 (c) 8 (d) 6

(7) The solution set of the equation : $x^2 = x$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{1\}$ (c) $\{-1 , 1\}$ (d) $\{0 , 1\}$

(8) The sign of the function $f : f(x) = x^2 + 2$ is positive in .....

(a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\mathbb{R} - \{0\}$ (d) $\mathbb{R} - \{2\}$

(9) If $(2 - i)$ is a root of the equation : $x^2 + b\,x + 5 = 0$, then b = ...

(a) $2 + i$ (b) 5 (c) -4 (d) $-2i$

(10) The measure of the central angle subtended an arc of length 2π in a circle of diameter length 12 cm. is equal to .....

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{5}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{2}$

(11) If $\sin x < 0$, $\tan x > 0$, then x lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(12) If $\sin\theta = -1$ and $\cos\theta =$ zero , then $\theta =$ .....

(a) 90° (b) 180° (c) 270° (d) 360°

(13) If $0° < \theta < 20°$ and $\sin(5\theta) = \cos(4\theta)$, then $\theta =$ .....

(a) 14° (b) 18° (c) 12° (d) 10°

(14) $f(x) = 3\sin x$, for each $x \in \mathbb{R}$, then the maximum possible value of the function $f(x) =$ .....

(a) -3 (b) 3 (c) 1 (d) zero

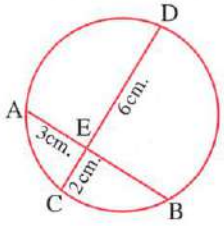
(15) If $\csc\theta = -2$, $270° < \theta < 360°$, then $\theta =$ .....

(a) 30° (b) 300° (c) 330° (d) 210°

(16) In the opposite figure :

If AE = 3 cm. , EC = 2 cm.

and ED = 6 cm. , then EB = ...



(a) 5 (b) 4

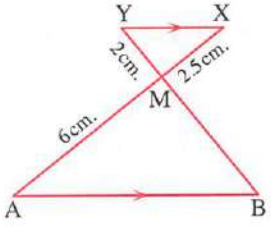
(c) 6 (d) 3

(17) If the ratio between the perimeter of two similar triangles is 1 : 4 , then the ratio between their two areas equals .....

(a) 1 : 2 (b) 1 : 4 (c) 1 : 8 (d) 1 : 16

(18) In the opposite figure :

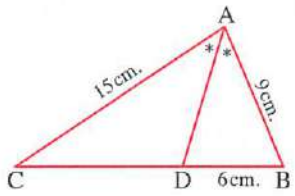
$\overleftrightarrow{AX} \cap \overleftrightarrow{YB} = \{M\}$, $\overleftrightarrow{XY} \parallel \overleftrightarrow{AB}$, then MB = ...



(a) 3.6 cm. (b) 4 cm.

(c) 4.2 cm. (d) 4.8 cm.

(19) In the opposite figure :

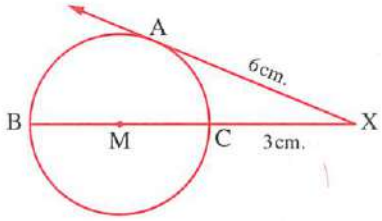


DC = ... cm.

(a) 10 (b) 6

(c) 9 (d) 5

(20) In the opposite figure :



$\overrightarrow{XA}$ is a tangent to circle M

, XA = 6 cm. , XC = 3 cm.

, then the area of the circle = ... cm^2

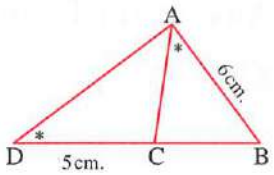
(a) 36 π (b) 81 π (c) 20.25 π (d) 6.25 π

(21) If A is a point on the plane of the circle M of radius length 3 cm. and AM = 4 cm.

, then $P_M(A)$ = ...

(a) 16 (b) 9 (c) 25 (d) 7

(22) In the opposite figure :



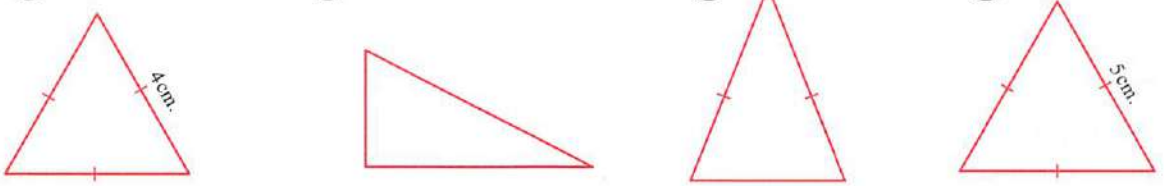
m (∠ BAC) = m (∠ D) , then BC = ...

(a) 3 cm. (b) 4 cm.

(c) 5 cm. (d) 6 cm.

(23) Which of the following triangles are similar .....

① ② ③ ④



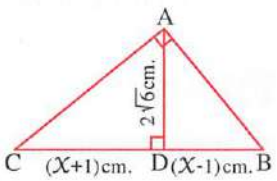
(a) ① and ④ (b) ② and ④ (c) ① and ③ (d) ③ and ④

(24) If Δ XYZ ~ Δ ABC , a (Δ XYZ) = 3 a (Δ ABC) and XY = 3 cm.

, then AB = ... cm.

(a) $\sqrt{3}$ (b) $3\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) 1

(25) In the opposite figure :



X = ... cm.

(a) 6 (b) 7

(c) 5 (d) 8

(26) The exterior bisector at the vertex of an isosceles triangle is ..... to the base.

(a) Parallel (b) equal (c) perpendicular (d) bisector

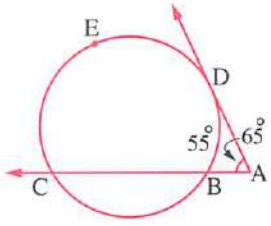
(27) All ..... are similar.

(a) triangles. (b) squares.

(c) rectangles. (d) parallelograms.

(28) In the opposite figure :

$\overrightarrow{AD}$ is a tangent , $\overrightarrow{AC}$ intersects the circle at B , C , m ($\angle$ A) = 65° , m ($\overset{\frown}{BD}$) = 55° , m ($\overset{\frown}{DEC}$) = (3 $\mathcal{X}$ + 5)° , then $\mathcal{X}$ = ...

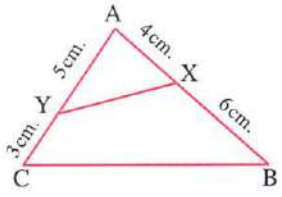


(a) 60° (b) 70° (c) 35° (d) 84°

Second Essay questions

Answer the following questions :

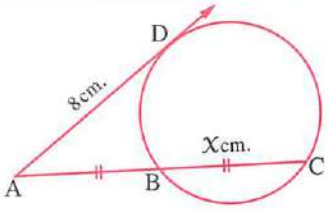
1 In the opposite figure :



(1) **Prove that :** Δ AXY ~ Δ ACB

(2) If the area of (Δ AXY) = 8 cm^2 , find the area of the polygon XBCY

2 In the opposite figure :



If AD = 8 cm. , AB = BC = $\mathcal{X}$ cm. , then find the value of $\mathcal{X}$

3 State two cases of similarity of two triangles.

4 If L , M are the roots of the equation : 3 $\mathcal{X}^2$ – 2 $\mathcal{X}$ – 7 = 0 , find the equation whose roots are L^2 , M^2

5 If 4 tan A – 3 = 0 where A is the greatest positive angle , A $\in$]0 , 2 π[, then without using calculator find the value of sin (180° – A) + cos (– A) + cot (360° – A)

3 **Cairo Governorate** — Elkalifa and Elmokattam Educational Zone Mathematics supervisoin

First Multiple choice questions

Choose the correct answer from the given ones :

(1) In circle M if MA = 5 cm. , diameter of circle = 6 cm. , then $P_M(A)$ = ...

(a) 16 (b) – 9 (c) 9 (d) – 16

(2) If $\mathcal{X} = 4 + 2i$, $y = 4 - 2i$, then $\mathcal{X}\, y$ = ...

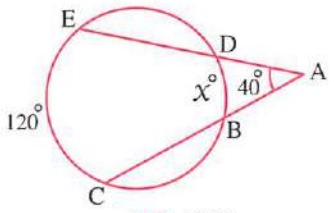
(a) 12 (b) 24 (c) 20 (d) 20 i

(3) **In the opposite figure :**

$m(\angle A) = 40°$

, $m(\overset{\frown}{EC}) = 120°$

, then $\mathcal{X}$ = ...°



(a) 40 (b) 60 (c) 120 (d) 170

(4) The solution set of the inequality : $\mathcal{X}^2 - 3\mathcal{X} + 2 \geq 0$ is .....

(a) $[1 , 2]$ (b) $\mathbb{R} -]-2 , -1[$ (c) $\mathbb{R} -]1 , 2[$ (d) $[-2 , -1]$

(5) If the ratio between two corresponding sides of two similar polygons equals 1 : 3 and the difference between their surface areas 200 cm^2 , then area of smaller polygon = ... cm^2

(a) 25 (b) 90 (c) 225 (d) 100

(6) The angle whose measure 1087° lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(7) Two similar triangles the ratio between their perimeters 5 : 3 , then the ratio between their areas is .....

(a) 5 : 3 (b) 3 : 5 (c) 9 : 25 (d) 25 : 9

(8) The simplest form of expression $(1 + i)^8$ is .....

(a) 16 (b) – 16 (c) 16 i (d) – 16 i

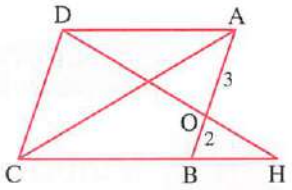
(9) The interior and exterior bisectors of angle of triangle include between them angle of measure .....

(a) 60° (b) 30° (c) 120° (d) 90°

(10) The S.S. of equation : $\mathcal{X}^2 + 16 = 0$ in $\mathbb{R}$ is .....

(a) $\{-2\}$ (b) $\{2\}$ (c) $\{-2 , 2\}$ (d) $\varnothing$

(11) In the opposite figure :



ABCD is parallelogram AO : OB = 3 : 2

area of Δ DHC = 100 cm^2

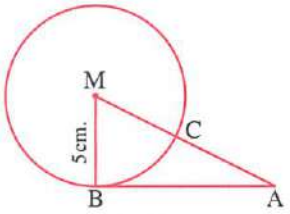
, then area of Δ ODA = ... cm^2

(a) 36 (b) 48 (c) 60 (d) 90

(12) If $f : f(\mathcal{X}) = 4 \sin 2\mathcal{X}$, then the greatest possible value of f is .....

(a) 1 (b) zero (c) 4 (d) 8

(13) In the opposite figure :



If $P_M(A) = 144$

, BM = 5 cm.

, then AC = ... cm.

(a) 18 (b) 8 (c) 12 (d) 16

(14) The sign of function $f : f(\mathcal{X}) = \mathcal{X} - 5$ is positive in the interval .....

(a) $]-\infty , 5[$ (b) $]5 , \infty[$ (c) $[-5 , \infty[$ (d) $]-\infty , -5[$

(15) If L and M are the two roots of the equation : $\mathcal{X}^2 + 3\mathcal{X} - 4 = 0$, the numerical value of the expression : $L^2 + 3L + 5$ = ...

(a) – 9 (b) – 4 (c) – 1 (d) 9

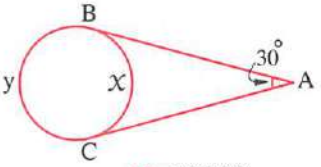
(16) If $\tan(180° + 5\theta) + \tan(270° + 4\theta) = 0$, then value of θ which satisfy the equation where $\theta \in]0 , 2\pi[$ could be equal .....

(a) 5° (b) 10° (c) 20° (d) 90°

(17) If one of the two roots of the equation : $3\mathcal{X}^2 - (k + 2)\mathcal{X} + k^2 + 2k = 0$ is multiplicative inverse of the other root , then k = ...

(a) – 3 , 1 (b) – 3 , – 1 (c) 3 , – 1 (d) 3 , 1

(18) In the opposite figure :

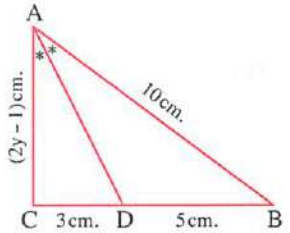


$\overline{AB}$, $\overline{AC}$ are two tangent segments to the circle , m (∠ A) = 30°

, then $y^2 - \mathcal{X}^2$ = ...

(a) 30 (b) 60 (c) 21600 (d) 10800

(19) In the opposite figure :



$\overrightarrow{AD}$ bisects ∠ A , $\frac{BD}{DC} = \frac{5}{3}$

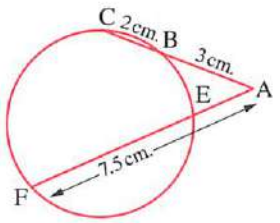
If AB = 10 cm. , AC = (2 y – 1) cm.

, then y = ... cm.

(a) 1.5 (b) 3.5

(c) 6 (d) 10

(20) In the opposite figure :



AB = 3 cm. , BC = 2 cm.

, AF = 7.5 cm.

, then EF = ...

(a) 2 (b) 3 (c) 5.5 (d) 7.5

(21) All ..... are similar.

(a) triangles (b) rectangles (c) squares (d) parallelograms

(22) The sign of the function f , where : $f(x) = x^2 - 2x - 3$ is negative when $x \in$ .....

(a) $]-\infty , -1[$ (b) $]-1 , 3[$ (c) $\mathbb{R} - [-1 , 3]$ (d) $]3 , \infty[$

(23) If the two roots of the equation : $k x^2 - 12x + 9 = 0$ are equal , then .....

(a) $k < 4$ (b) $k = 4$ (c) $k > 4$ (d) $k = 144$

(24) If the two roots of the equation : $8x^2 - ax + 3 = 0$ are positive and the ratio between them is 2 : 3 , then a = ...

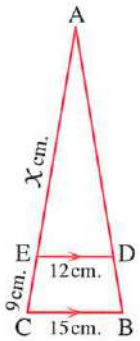
(a) 1 (b) – 1 (c) – 10 (d) 10

(25) If $\theta \in]\frac{\pi}{2} , \pi[$, $\sin\theta = \frac{12}{13}$, then the value of :

$\csc\theta \sin\theta - \tan\theta \cot\theta + \cos^2\theta =$ .....

(a) $\frac{169}{25}$ (b) $\frac{144}{169}$ (c) $\frac{25}{169}$ (d) $\frac{169}{144}$

(26) In the opposite figure :



$x =$ .....

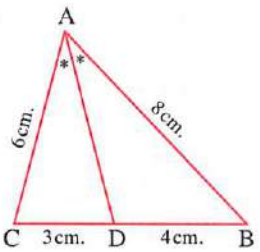
(a) 32

(b) 40

(c) 36

(d) 10

(27) In the opposite figure :



AD = ... cm.

(a) 4 (b) 8

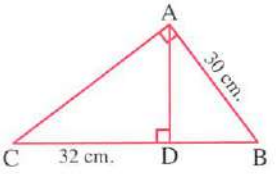
(c) 6 (d) 5

(28) In the opposite figure :

ABC is a right angled triangle at A

, $\overline{AD} \perp \overline{BC}$, AB = 30 cm. , CD = 32 cm.

, then AD = ... cm.



(a) 18 (b) 25 (c) 24 (d) 20

Second Essay questions

Answer the following questions :

1 If L , M are two roots of equation : $x^2 - 3x + 5 = 0$, form equation whose roots are L^2 , M^2

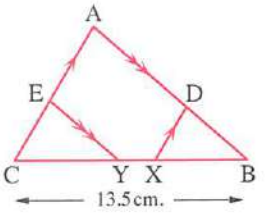
2 Find circumference of circle which contains central angle of measure 120° and subtends arc of length 6 cm.

3 **In the opposite figure :**

$\overline{DX} // \overline{AC}$, $\overline{EY} // \overline{AB}$

, BC = 13.5 cm. , $\frac{AD}{DB} = \frac{3}{2}$, $\frac{EC}{AE} = \frac{4}{5}$

, then find the length of XY



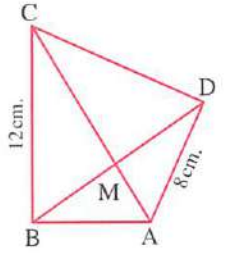
4 **In the opposite figure :**

ABCD is cyclic quadrilateral

, AD = 8 cm.

, CB = 12 cm.

Find : Area (Δ AMD) : Area (Δ BMC)



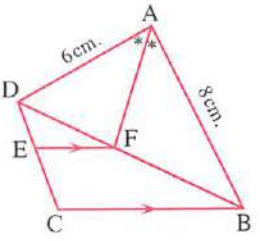
5 **In the opposite figure :**

$\overrightarrow{AF}$ bisects ∠ BAD

, $\overline{EF}$ parallel to $\overline{BC}$

, AB = 8 cm. , AD = 6 cm.

Find : $\frac{DE}{EC}$



4 Giza Governorate — Omrania Educational Directorate

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If L , 3 – L are the two roots of the equation : $x^2 + a x - 7 = 0$, then a = ...

(a) – 3 (b) 3 (c) – 5 (d) 5

(2) If the length of an arc in a circle equals quarter of its circeumference , then the measure of its inscribed angle subtanded to this arc equals .....

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) $\frac{\pi}{6}$

(3) The maximum value of $f : f(x) = 2 + 3 \sin 2\theta$ is ..... where $\theta \in [0 , 2\pi[$

(a) 5 (b) – 5 (c) 3 (d) – 3

(4) If 3 + 2 i is one of the roots of $x^2 - a x + b = 0$, then a + b = ...
where a , $b \in \mathbb{R}$

(a) – 7 (b) 7 (c) 19 (d) 6

(5) If $\sin\theta = -0.6$, $\theta \in]\pi , \frac{3\pi}{2}[$, then $\tan\theta + \cos\theta$ = ...

(a) $\frac{27}{20}$ (b) $\frac{31}{20}$ (c) $\frac{1}{20}$ (d) $-\frac{1}{20}$

(6) If $\tan(2\theta + 15°) = \cot(\theta + 30°)$, $\theta \in]0 , \frac{\pi}{4}[$, then $\sin^2 3\theta + \tan^2 4\theta$ = ...

(a) 3.5 (b) – 3.5 (c) 2.5 (d) – 2.5

(7) If one of the roots of the equation : $(2a - 5) x^2 + 7x + a = 0$ is multiplicative inverse of the other root , then a = ...

(a) – 6 (b) 6 (c) 5 (d) – 5

(8) The soluation set of the equation : $x^2 + 16 = 0$ is ..... where $x \in \mathbb{R}$

(a) $\{4i , -4i\}$ (b) $\{4 , -4\}$ (c) $\{-4\}$ (d) $\varnothing$

(9) If $13 \sin\theta + 5 = 0$, θ is greatest positive angle in $[0 , 360°[$
, then $\sin(90° + \theta) \tan(360° - \theta)$ = ...

(a) $\frac{12}{13}$ (b) $-\frac{12}{13}$ (c) $\frac{5}{13}$ (d) $-\frac{5}{13}$

(10) If one of the roots of the equation : $x^2 - 9x + m = 0$ is double the other root , then m = ...

(a) 18 (b) 20 (c) 14 (d) 26

(11) Solution set of the equation $2\cos\theta + \sqrt{2} = 0$ is ..... where $\theta \in [0 , 2\pi[$

(a) $\{\frac{\pi}{4}\}$ (b) $\{\frac{\pi}{4} , \frac{5\pi}{4}\}$ (c) $\{\frac{3\pi}{4} , \frac{5\pi}{4}\}$ (d) $\{\frac{5\pi}{4}\}$

(12) If $(a + i\,b)(3 + 4i) = (2 + i)(2 - i)$, then $a^2 + b^2 =$ .....

(a) -1 (b) 1 (c) -2 (d) 2

(13) If $\Delta ABC \sim \Delta XYZ$, area $(\Delta ABC) = 9$ area (ΔXYZ) , then AB = ...

(a) 9 XY (b) 3 XY (c) 3 YZ (d) 3 XZ

(14) If $x = 3$ is one of the roots of the equation : $x^2 + 2mx = 3$, then m = ...

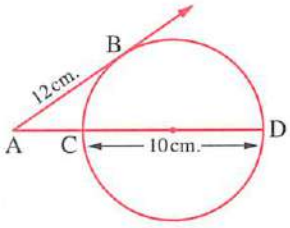
(a) -1 (b) 1 (c) 2 (d) -2

(15) **In the opposite figure :**

$\overrightarrow{AB}$ is a tangent its length 12 cm.

$\overline{CD}$ is a diameter of length 10 cm.

, then AC = ...



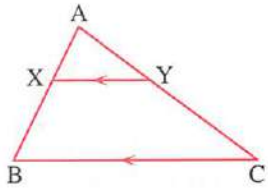
(a) 10 cm. (b) 8 cm. (c) 18 cm. (d) 6 cm.

(16) **In the opposite figure :**

$\overline{XY} // \overline{BC}$, AX : XB = 2 : 3

, area of $\Delta AXY = 16$ cm^2

, then the area of trapezium XYCB = ... cm^2



(a) 36 (b) 32 (c) 84 (d) 40

(17) If L , M are the two roots of the equation : $x^2 - 5x + 3 = 0$, then the equation whose roots 3 L , 3 M is .....

(a) $x^2 + 15x + 27 = 0$ (b) $x^2 - 15x + 9 = 0$

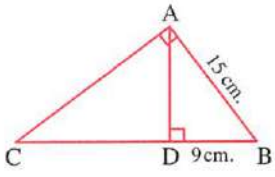
(c) $x^2 - 15x + 27 = 0$ (d) $x^2 - 9x + 15 = 0$

(18) **In the opposite figure :**

$m(\angle CAB) = m(\angle ADB) = 90°$

, AB = 15 cm. , BD = 9 cm.

, then AC + AD = ... cm.



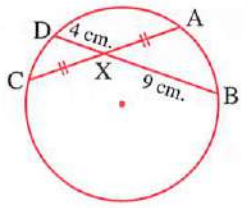
(a) 28 (b) 25 (c) 35 (d) 32

(19) The soluation set of the inequality : $x^2 + 9 < 0$ is .....

(a) $\varnothing$ (b) $[-3 , 3]$

(c) $\mathbb{R} - [-3 , 3]$ (d) $\mathbb{R} - \{-3 , 3\}$

(20) In the opposite figure :



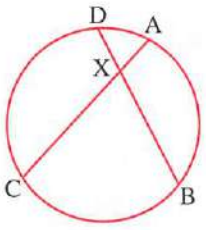
$\overline{AC} \cap \overline{BD} = \{X\}$, AX = XC

, DX = 4 cm. , XB = 9 cm.

, then AC = ... cm.

(a) 6 (b) 13 (c) 12 (d) 18

(21) In the opposite figure :



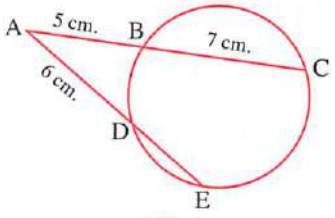
If m $(\overset{\frown}{AB}) = 100°$, m $(\overset{\frown}{CD}) = 120°$

, then m $(\angle AXD)$ = ...

(a) 110° (b) 70°

(c) 140° (d) 180°

(22) In the opposite figure :



AD = 6 cm. , AB = 5 cm.

, BC = 7 cm.

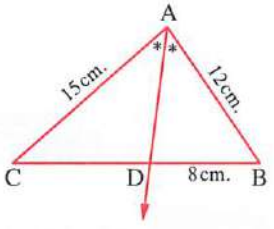
, then DE = ... cm.

(a) 12 (b) 7 (c) 10 (d) 4

(23) In the figure of number (22) If m $(\angle A) = 35°$, m $(\overset{\frown}{CE}) = 100°$, then m $(\overset{\frown}{BD})$ = ...

(a) 30° (b) 70° (c) 100° (d) 40°

(24) In the opposite figure :



$\overrightarrow{AD}$ is interior bisector of $\angle A$

, AB = 12 cm.

, AC = 15 cm. , BD = 8 cm.

, then CD = ... cm.

(a) 12 (b) 10 (c) 8 (d) 15

(25) In the figure of number (24) The ratio between area of Δ ABD : area of Δ ABC = ...

(a) 4 : 9 (b) 4 : 5 (c) 5 : 9 (d) 5 : 10

(26) In the figure of number (24) The length of $\overline{AD}$ = ... cm.

(a) $\sqrt{10}$ (b) 8 (c) 10 (d) $2\sqrt{2}$

(27) If M is a circle , A is a point in its plane where MA = 6 cm. , $P_M(A) = -13$

, then area of circle M = ... cm^2 $\left(\pi = \frac{22}{7}\right)$

(a) 154 (b) 44 (c) 144 (d) 7

(28) $\overline{AB}$, $\overline{AC}$ are two tangent to circle M , m $(\overset{\frown}{BC}) = 120°$, then m $(\angle A)$ = ...

(a) 120° (b) 60° (c) 100° (d) 180°

Second Essay questions

Answer the following questions :

1 Find in $\mathbb{R}$ the solution set of the inequality : $x^2 - 4x - 5 > 0$

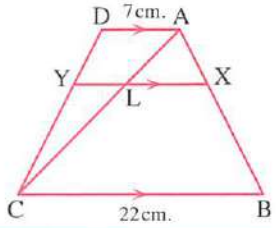
2 Solve the equation : $\cos(\pi + \theta) = \sin(390°)\cos(-60°) + \cos(30°)\sin(120°)$

3 **In the opposite figure :**

$\overleftrightarrow{AD} // \overleftrightarrow{XY} // \overleftrightarrow{BC}$

, $\frac{AX}{XB} = \frac{2}{3}$

Find : XY

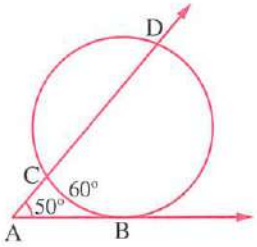


4 **In the opposite figure :**

m ($\angle$ A) = 50°

, m ($\overset{\frown}{BC}$) = 60°

Find : m ($\overset{\frown}{BD}$)

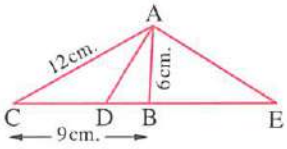


5 **In the opposite figure :**

$\overrightarrow{AD}$ and $\overrightarrow{AE}$ are the interior and exterior bisectors of $\angle$ CAB ,

AC = 12 cm. , AB = 6 cm. , BC = 9 cm.

Find the length of $\overline{AE}$



5 Giza Governorate — Abou El-Nomros Educational Zone

First Multiple choice questions

Choose the correct answer from the given ones :

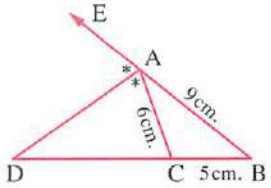
(1) In the opposite figure :

$\overrightarrow{AD}$ bisect ($\angle$ EAC)

, then CD = ... cm.

(a) 5 (b) 10

(c) 12 (d) 18



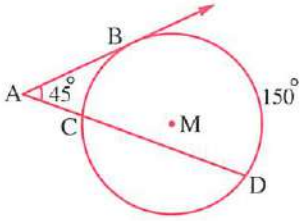
(2) If one root of the quadratic equation : $a x^2 + 4x + 7 = 0$ is a multiplicative inverse of the other , then a = ...

(a) $\frac{1}{7}$ (b) 7 (c) 4 (d) – 7

(3) In the opposite figure :

$m(\overset{\frown}{BD}) = 150°$, $m(\angle A) = 45°$

, then $m(\overset{\frown}{BC})$ = ...°



(a) 60 (b) 120

(c) 90 (d) 195

(4) All the following measure of angles lie in the second quadrant except .....

(a) – 240 (b) 100 (c) – 120 (d) 860

(5) If two roots of quadratic equation : $x^2 - 6x + k = 0$ are equal and real

, then k = ...

(a) 4 (b) – 4 (c) 9 (d) – 9

(6) If $P_M(A) > 0$, then the point A located ..... the circle M.

(a) inside (b) outside (c) on (d) on the centre of

(7) The measure of central angle subtended by arc of length π cm. in circle of diameter 8 cm. equal .....

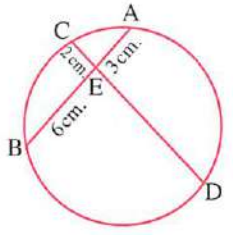
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{4}$ (c) $\frac{2\pi}{3}$ (d) 2π

(8) If $\overline{AB} \cap \overline{CD} = \{E\}$,

AE = 3 cm. , CE = 2 cm.

, BE = 6 cm.

, then ED = ... cm.



(a) 9 (b) 8 (c) 7 (d) 6

(9) If the two similar polygons are congruent , then the scale factor is .....

(a) $\frac{1}{2}$ (b) 1 (c) more than 1 (d) less than 1

(10) The sign of function $f : f(x) = 4 - 2x$ positive if .....

(a) $x > 4$ (b) $x < 4$ (c) $x > 2$ (d) $x < 2$

(11) The range of function $f : f(x) = 2 \cos 3x$ is .....

(a) $[-2 , 2]$ (b) $]2 , 3[$ (c) $]-2 , 2[$ (d) $]-3 , 3[$

(12) If a line intersects two sides in a triangle and divides them into segments whose lengths are proportional , then it is ..... to the third side.

(a) intersect (b) parallel (c) bisect (d) equal

(13) If L and M are two roots of the quadratic equation : $x^2 - 7x + 12 = 0$

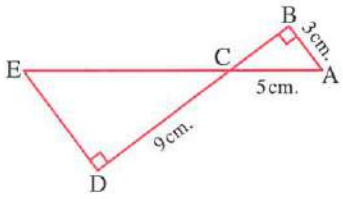
, then $L^2 + M^2 =$ .....

(a) 7 (b) 12 (c) 25 (d) 49

(14) In the given figure :

If $\overline{BD} \cap \overline{AE} = \{C\}$

, then : $\frac{\text{the area of the smaller triangle}}{\text{the area of the greater triangle}} =$ $\frac{.....}{.....}$



(a) $\frac{25}{81}$ (b) $\frac{1}{3}$

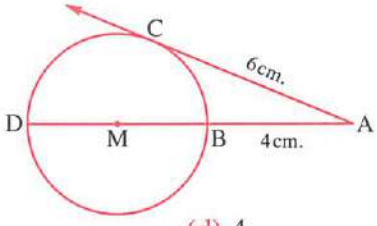
(c) $\frac{16}{81}$ (d) $\frac{9}{64}$

(15) In the opposite figure :

$\overline{BD}$ is a diameter , $\overrightarrow{AC}$ is a tangent

, AC = 6 cm. , AB = 4 cm.

, then the radius of circle equal ..... cm.



(a) 5 (b) 9 (c) 2.5 (d) 4

(16) The solution set of the inequality : $x^2 \leq 5x - 4$ in $\mathbb{R}$ .....

(a) $\mathbb{R} -]1 , 4[$ (b) $\mathbb{R} - [1 , 4]$ (c) $[1 , 4]$ (d) $]1 , 4[$

(17) If the ratio between the perimeter of two similar triangles is 4 : 9 , then the ratio between their areas is .....

(a) 4 : 3 (b) 4 : 9 (c) 16 : 81 (d) 3 : 2

(18) If $\sin\theta = \cos B$ and θ , B are two acute angles , then $\tan(\theta + B) =$ .....

(a) – 1 (b) 1 (c) $\sqrt{3}$ (d) undefind.

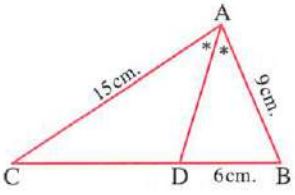
(19) If $x = 5$ is one of the two roots of the equation : $x^2 + a x = 2a + 4$

, then a = ...

(a) – 7 (b) 7 (c) $\frac{29}{3}$ (d) $\frac{-29}{3}$

(20) In the opposite figure :

The length of $\overline{CD}$ = ... cm.



(a) 5 (b) 6

(c) 9 (d) 10

(21) If the terminal side of the angle θ in the standard position intersects the unit circle at the point $(x , -x)$, $x > 0$, then m $(\angle\theta)$ = ...

(a) 225° (b) 315° (c) 135° (d) 45°

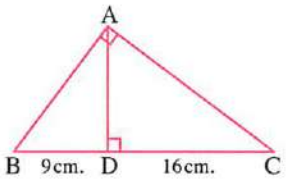
(22) $(1 + i)^4 - (1 - i)^4 =$ .....

(a) zero (b) 8 (c) – 8 (d) 4

(23) In the opposite figure :

$\overline{AC} \perp \overline{AB}$, $\overline{AD} \perp \overline{BC}$

, the length of $\overline{AB}$ = ... cm.



(a) 12 (b) 15

(c) 20 (d) 25

(24) If L , M are the roots of the equation : $x^2 - 7x + 3 = \text{zero}$, then the equation whose roots 2 L , 2 M is .....

(a) $x^2 - 14x + 12 = 0$ (b) $x^2 - 14x - 12 = 0$

(c) $x^2 + 14x + 12 = 0$ (d) $x^2 + 14x - 12 = 0$

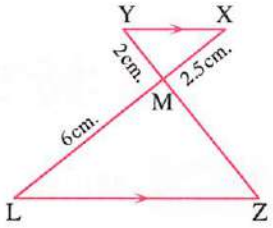
(25) If Δ ABC is right-angled triangle at B , $\cos C = \frac{1}{2}$, then $\sin (A + B + 2C)$ .....

(a) $\frac{1}{2}$ (b) $\frac{-1}{2}$ (c) $\frac{-\sqrt{3}}{2}$ (d) zero

(26) In the opposite figure :

$\overleftrightarrow{XL} \cap \overleftrightarrow{YZ} = \{M\}$, $\overleftrightarrow{XY} // \overleftrightarrow{ZL}$

, then the length of $\overline{MZ}$ .....



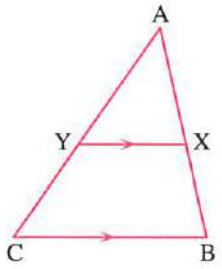
(a) 3.6 (b) 4

(c) 4.2 (d) 4.8

(27) If 2 and 7 are two roots the equation : $x^2 + a x + b = 0$, then $a + b$ = ...

(a) 5 (b) – 5 (c) 23 (d) – 23

(28) All of the following mathematical expressions are true except .....



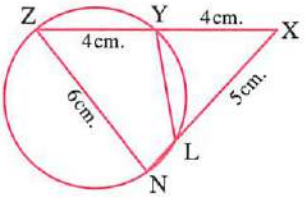
(a) $\frac{AX}{XB} = \frac{XY}{BC}$ (b) $\frac{AX}{AB} = \frac{XY}{BC}$

(c) $\frac{AY}{YC} = \frac{AX}{XB}$ (d) $\frac{AY}{AC} = \frac{AX}{AB}$

Second Essay questions

Answer the following questions :

1 In the opposite figure :



XL = 5 cm. , XY = YZ = 4 cm. , NZ = 6 cm.

Find with proof :

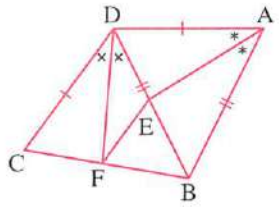
The length of $\overline{LN}$, $\overline{YL}$

2 **In the opposite figure :**

ABCD is a quadrilateral

, AB = BD , AD = DC , $\overrightarrow{AE}$ bisects ∠ A , $\overrightarrow{DF}$ bisects ∠ BDC

Prove that : $\overline{EF}$ // $\overline{DC}$



3 Find the solution set of the equation : $x^2 - 2x + 4 = 0$ in $\mathbb{C}$

4 If the difference between two complements angles is $\frac{\pi}{3}$ find the degree and radian measure of the two angles.

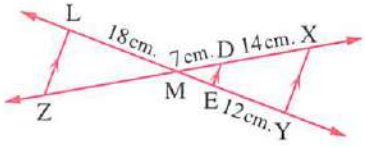
5 **In the opposite figure :**

$\overline{XY}$ // $\overline{DE}$ // $\overline{LZ}$

Find with proof :

the length of $\overline{EM}$

, the length of $\overline{MZ}$



6 Giza Governorate — Inspection of Math

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If one of the two roots of the equation : $3x^2 + (a + 3)x + 7 = 0$ is the additive inverse of the other , then : a = ...

(a) – 3 (b) 3 (c) $\frac{1}{3}$ (d) $\frac{-1}{3}$

(2) If $(3x - y) + (x + y)i = \frac{2}{1+i}$, then $y - x$ = ...

(a) zero (b) – 1 (c) 1 (d) i

(3) If the two roots of the equation : $x^2 + 4x + k = 0$ are real and different , then k ∈ .....

(a)]4 , ∞[(b)]– ∞ , 4[(c)]– ∞ , ∞[(d) [4 , ∞[

(4) The solution set of the inequality : $(x - 3)(x - 7) < 0$ in $\mathbb{R}$ is .....

(a) {3 , 7} (b)]3 , 7[(c) [3 , 7] (d) $\mathbb{R}$ – [3 , 7]

(5) If (2 + i) is one of the two roots of the equation : $x^2 - 4x + c = 0$, then the value of c = ...

(a) 16 (b) – 16 (c) – 5 (d) 5

(6) The quadratic equation whose two roots are $(2 - 3\,i)$, $(2 + 3\,i)$ is .....

(a) $X^2 - 4X + 13 = 0$ (b) $X^2 + 4X + 13 = 0$

(c) $X^2 + 4X - 13 = 0$ (d) $X^2 - 4X - 13 = 0$

(7) If L is one of the two root of the equation : $X^2 - 4X + 1 = 0$, then the numerical value the expression : $L^2 - 4L + 5$ is .....

(a) 4 (b) -4 (c) 5 (d) -5

(8) If $f(X) = X + 2$, where : $X \in]-4 , 3[$, then $f(X)$ is negative when $X \in$ .....

(a) $[-4 , -2]$ (b) $]-4 , -2[$ (c) $[-2 , 3]$ (d) $]-2 , 3[$

(9) The conjugate number of : $3\,i - 7$ equals .....

(a) $3\,i + 7$ (b) $-3\,i - 7$ (c) $-3\,i + 7$ (d) $\frac{1}{3\,i - 7}$

(10) The range of the function f : $f(\theta) = 4 \sin 2\theta$ where $\theta \in [0 , 2\pi[$ equals .....

(a) $[-4 , 4]$ (b) $]-4 , 4[$ (c) $[-2 , 2]$ (d) $]-2 , 2[$

(11) If the terminal side of the angle of measure 30° in the standard position in the unit circle rotates three and half revolutions clockwise , then the terminal side lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(12) If $\cos\theta > 0$, $\sin\theta < 0$, then θ lies in the .....quadrant.

(a) first (b) second (c) third (d) fourth

(13) The angle of measure $\frac{-5\pi}{9}$ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

(14) The arc of length $8\,k\,\pi$ cm. in a circle whose radius of length 24 k cm. is subtends an inscribed angle of measure .....

(a) 60° (b) 30° (c) 120° (d) $(60\,k)°$

(15) If the ratio between the perimeters of two similar polygons 4 : 9 , then the ratio between their surface areas = ...

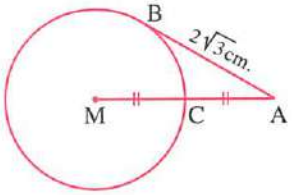
(a) 2 : 3 (b) 4 : 13 (c) 16 : 81 (d) 4 : 9

(16) Any two regular polygons having the same number of sides are .....

(a) congruent. (b) equal in area.

(c) equal in perimeter. (d) similar.

(17) In the opposite figure :

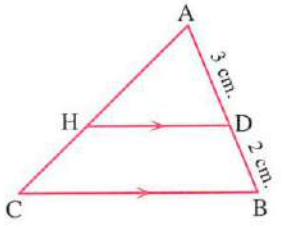


The radius length of circle M = ... cm.

(a) 2 (b) 3

(c) 4 (d) 5

(18) In the opposite figure :

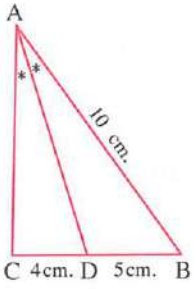


$$\frac{\text{The area of } (\Delta \text{ ADH})}{\text{The area of (figure DBCH)}} = \text{.....}$$

(a) $\frac{3}{2}$ (b) $\frac{9}{16}$

(c) $\frac{9}{25}$ (d) $\frac{3}{5}$

(19) In the opposite figure :



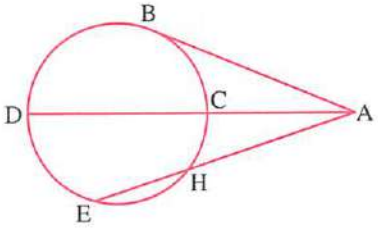
$\overrightarrow{AD}$ bisects $\angle$ BAC

, then AD = ... cm.

(a) 8 (b) 60

(c) $2\sqrt{15}$ (d) $7\sqrt{3}$

(20) In the opposite figure :



All of the following expressions are true

, except .....

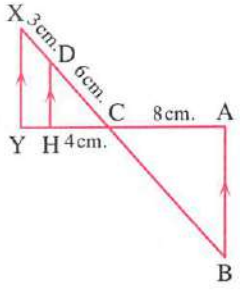
(a) $(AB)^2 = AC \times AD$

(b) $(AB)^2 = AH \times AE$

(c) $AC \times AD = AH \times AE$

(d) $AC \times CD = AH \times HE$

(21) In the opposite figure :



$\overline{AB} // \overline{DH} // \overline{XY}$, $\overline{AY} \cap \overline{BX} = \{C\}$, AC = 8 cm.

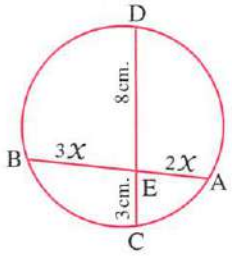
, CH = 4 cm. , CD = 6 cm.

, DX = 3 cm. , then BC + HY = ... cm.

(a) 12 (b) 15

(c) 8 (d) 14

(22) In the opposite figure :



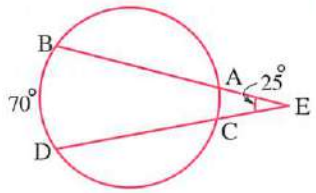
EC = 3 cm. , ED = 8 cm.

, then the value of x = ... cm.

(a) 2 (b) 4

(c) 8 (d) 6

(23) In the opposite figure :

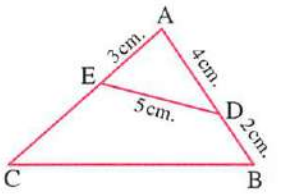


m $\overset{\frown}{(AC)}$ = ... °

(a) 20 (b) 30

(c) 40 (d) 50

(24) In the opposite figure :



$\Delta ABC \sim \Delta AED$, AE = 3 cm. , AD = 4 cm. , BD = 2 cm.

, DE = 5 cm. , then BC = ... cm.

(a) 2.5 (b) 10

(c) 7.5 (d) 7

(25) Two triangles in which the first whose two angles of measure 50° , 60° and the second whose two angles of measure 60° , 70° , then the two triangles are .....

(a) congruent and not similar. (b) similar.

(c) congruent and similar. (d) not congruent and not similar.

(26) If $P_M(A) = -9$, then this means that .....

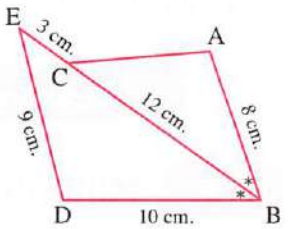
(a) the point A lies outside the circle whose center M.

(b) the point A lies inside the circle whose center M.

(c) the radius length of the circle whose center M equals 9 length unit.

(d) the length of the tangent segment drawn from the point A to the circle whose center M equals 3 length unit.

(27) In the opposite figure :

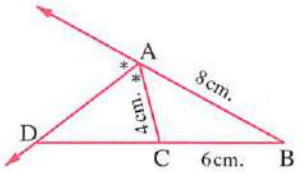


AC = ... cm.

(a) 6.2 (b) 6

(c) 7.2 (d) 7

(28) In the opposite figure :



$\overrightarrow{AD}$ bisects ∠ A externally

CD = ... cm.

(a) 2 (b) 4

(c) 6 (d) 8

Second Essay questions

Answer the following questions :

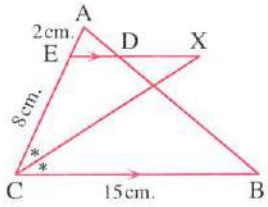
1 **In the opposite figure :**

If $\overrightarrow{CX}$ bisects $\angle ACB$, $\overline{XE} // \overline{BC}$

$AE = 2$ cm. , $EC = 8$ cm.

, $BC = 15$ cm.

Find the length of XD



2 Find the solution set of the following inequality : $X(X + 4) \leq 12$

3 If $\sin\theta = \frac{4}{5}$, where θ is the greatest positive angle in $[0 , 360°[$, then find : $\sin(180° - \theta) + \tan(90° - \theta)$

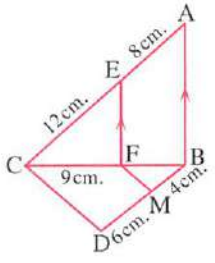
4 **In the opposite figure :**

$\overline{AB} // \overline{EF}$, $AE = 8$ cm. , $CE = 12$ cm.

$CF = 9$ cm. , $BM = 4$ cm. , $DM = 6$ cm.

, then : (1) **Find :** the length of $\overline{BF}$

(2) **Prove that :** $\overline{FM} // \overline{CD}$



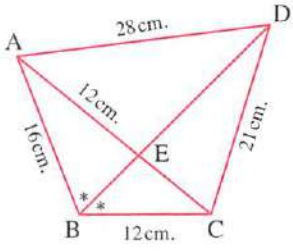
5 **In the opposite figure :**

$\overrightarrow{BE}$ bisects $\angle ABC$

, $BC = AE = 12$ cm.

, $AB = 16$ cm. , $DC = 21$ cm. , $AD = 28$ cm.

Prove that : $\overrightarrow{DE}$ bisects $\angle ADC$



7 El-Kalyoubia Governorate — El-obour Educational Zone, Manart El-Bayan Secondary Schools

First Multiple choice questions

Choose the correct answer from the given ones :

(1) i^{37} = ...

(a) -1 (b) 1 (c) $-i$ (d) i

(2) Conjugate $2i - 5$ is .....

(a) $2i + 5$ (b) $2i - 5$ (c) $-2i - 5$ (d) $-5 + 2i$

(3) Form the quadratic equation with the two roots $1 + i$, $1 - i$ .....

(a) $X^2 + X + 2 = 0$ (b) $X^2 + 2X + 2 = 0$ (c) $X^2 - 2X + 2 = 0$ (d) $X^2 + 2 = 0$

(4) L , 2 – L two roots $X^2 - kX + 6 = 0$, then k = ...

(a) 6 (b) 3 (c) 5 (d) 2

(5) L , M are the two roots of the equation : $X^2 - 5X + 3 = 0$, then $L^2 + M^2$ = ...

(a) 9 (b) 5 (c) 19 (d) 22

(6) If $\tan(180° + \theta) = 1$ where θ is the smallest positive angle , then θ = ...

(a) 60° (b) 30° (c) 45° (d) 135°

(7) The solution set of the equation : $X^2 = X$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{0 , 1\}$ (c) $\{0 , -1\}$ (d) $\{1\}$

(8) $f(X) = 6 - 2X$ positive at $X \in$ .....

(a) $X \leq 3$ (b) $X \geq 3$ (c) $X > 3$ (d) $X < 3$

(9) If L is one of the two roots of the equation : $X^2 - 5X - 3 = 0$, then $L^2 - 5L + 7$ = ...

(a) 10 (b) 4 (c) 12 (d) – 4

(10) The arc length in a circle of radius 6 cm. opposite to central angle $\frac{\pi}{2}$ is = ... cm.

(a) $\frac{3\pi}{2}$ (b) 2π (c) $\frac{5}{2}\pi$ (d) 3π

(11) If $5 \sin\theta = 4$, $90° < \theta < 180°$, then $3 \cot(90° + \theta)$ = ...

(a) 5 (b) – 5 (c) 4 (d) – 3

(12) The solution set of the inequality : $(X - 3)(X - 7) < 0$ in $\mathbb{R}$ is .....

(a) $\{3 , 7\}$ (b) $]3 , 7[$ (c) $[3 , 7]$ (d) $\mathbb{R} - [3 , 7]$

(13) If $f(X) = 4 \sin X$, $X \in [0 , \pi]$ the rang of function .....

(a) $[0 , 4]$ (b) $]0 , 4[$ (c) $]-4 , 0[$ (d) $[-4 , 4]$

(14) If $\sin\theta = \cos\theta$ where θ is acute angle , then $\tan 2\theta$ = ...

(a) 1 (b) – 1 (c) undefined. (d) $\sqrt{3}$

(15) Two similar polygons , ratio between their perimeters equal 4 : 9 , then ratio between the lengths of two corresponding side is .....

(a) 4 : 9 (b) 2 : 3 (c) 16 : 81 (d) 9 : 4

(16) Two similar rectangles , the dimensions of the first are 12 cm. , 8 cm. and the perimeter of the second equal = 60 cm. the area of the second = ... cm^2

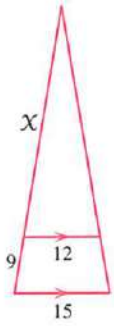
(a) 100 (b) 216 (c) 500 (d) 864

(17) In the opposite figure :

x = ... cm.

(a) 12 (b) 24

(c) 36 (d) 48

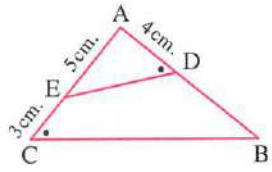


(18) In the opposite figure :

BD = ... cm.

(a) 5 (b) 6

(c) 4 (d) 7

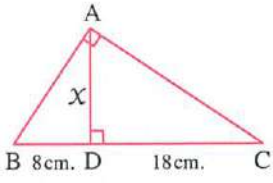


(19) In the opposite figure :

x = ... cm.

(a) $12\sqrt{3}$ (b) 24

(c) 12 (d) $8\sqrt{3}$



(20) If $\Delta ABC \sim \Delta XYZ$, AB = 3 XY , then $\frac{\text{area of } (\Delta XYZ)}{\text{area of } (\Delta ABC)}$ = ...

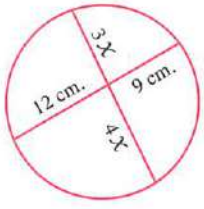
(a) 3 (b) $\frac{1}{3}$ (c) $\frac{1}{9}$ (d) 9

(21) In the opposite figure :

x = ... cm.

(a) 3 (b) 9

(c) 18 (d) 21

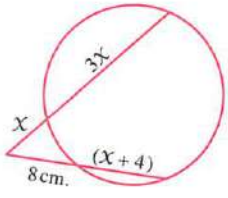


(22) In the opposite figure :

x = ... cm.

(a) 5 (b) 6

(c) 3 (d) 9

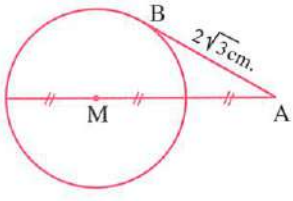


(23) In the opposite figure :

The length of the radius of circle M = ... cm.

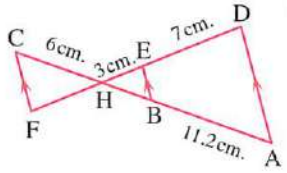
(a) 2 (b) 4

(c) 3 (d) 5



(24) In the opposite figure :

$\overline{AD} // \overline{BE} // \overline{FC}$, then HF = ... cm.

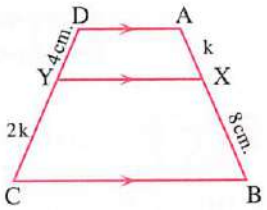


(a) 3.6 (b) 4.8

(c) 6.3 (d) 3.75

(25) In the opposite figure :

$\overline{AD} // \overline{XY} // \overline{BC}$, then K = ...

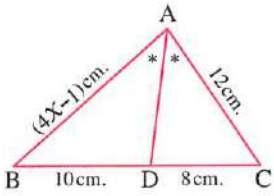


(a) $\frac{3}{8}$ (b) 4

(c) 16 (d) 32

(26) In the opposite figure :

$\mathcal{X}$ = ... cm.



(a) 3 (b) 4

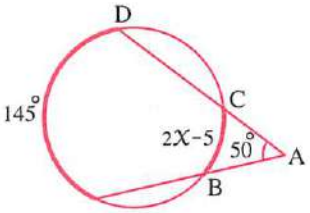
(c) 4.5 (d) 6

(27) If M is a circle of radius length 3 cm. , A is a point lies in its plane where MA = 4 cm. , then P_M (A) = ...

(a) $\sqrt{7}$ (b) 9 (c) 7 (d) – 7

(28) In the opposite figure :

$\mathcal{X}$ = ...



(a) 50° (b) 25°

(c) 100° (d) 75°

Second Essay questions

Answer the following questions :

1 Investigate the sign of the function $f(\mathcal{X}) = 4 - \mathcal{X}^2$ and determine the solution $4 - \mathcal{X}^2 \leq 0$

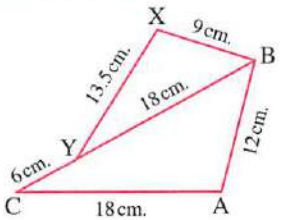
2 Find the general solution of the equation : $\cos 2\theta = \sin 4\theta$

3 If L + 1 , M + 1 are two roots of the equation : $\mathcal{X}^2 - 7\mathcal{X} + 5 = 0$, then form the equation whose two roots L^2 , M^2

4 In the opposite figure :

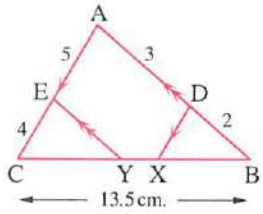
B , Y and C are collinear prove that

$\Delta XBY \sim \Delta ABC$



5 **In the opposite figure :**

The length of $\overline{XY}$ = ...



8 El-Monoufia Governorate

Quesna Educational directorate
Mathematics Supervision

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The sign of the function f : $f(x) = 6 - 2x$ is non-positive when .....

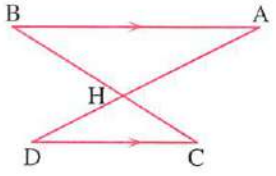
(a) $x > 3$ (b) $x \leq 3$ (c) $x < 3$ (d) $x \geq 3$

(2) In the opposite figure :

$\overline{AB} // \overline{DC}$, 2 AH = 3 HD

, BH – CH = 4 cm.

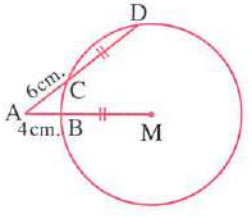
, then BC = ... cm.



(a) 18 (b) 20 (c) 24 (d) 25

(3) In the opposite figure :

CD = BM , then the circumference of the circle M = ... cm.



(a) 15 π (b) 18 π

(c) 20 π (d) 24 π

(4) If ABC is a right-angled triangle at B , $\sin A + \cos C = 1$, then $\tan C$ = ...

(a) 1 (b) – 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

(5) The solution set of the equation : $x^2 + 9 = 0$ in the set of complex numbers is .....

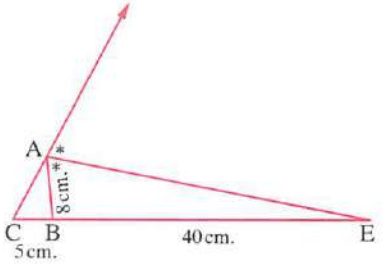
(a) $\{3 , -3\}$ (b) $\{-3i\}$ (c) $\{3i , -3i\}$ (d) $\varnothing$

(6) In the opposite figure :

AE = ... cm.

(a) 32 (b) 45

(c) 48 (d) $24\sqrt{3}$



(7) If $\sin \mathcal{X} = \cos y$, then $\sin (\mathcal{X} + y) =$ .....

(a) 1 (b) zero (c) – 1 (d) otherwise.

(8) If one of the two roots of the equation : $4 k \mathcal{X}^2 + 7 \mathcal{X} + k^2 + 4 = 0$ is the multiplicative inverse of the other root , then k = ...

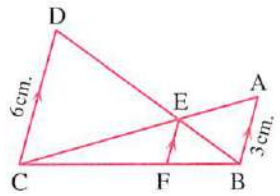
(a) ± 2 (b) 3 (c) 4 (d) 2

(9) If $\Delta ABC \sim \Delta XYZ$ and $3 AB = 2 XY$, then area of ΔABC : area of ΔXYZ = ...

(a) 4 : 9 (b) 9 : 4 (c) 2 : 3 (d) 3 : 2

(10) In the opposite figure :

If $\overline{AB} // \overline{EF} // \overline{CD}$, then EF = ... cm.



(a) 2.5 (b) 2

(c) 1.5 (d) 1

(11) $(1 - i)^{12}$ = ...

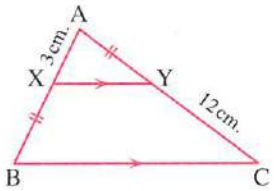
(a) – 64 i (b) 64 i (c) – 64 (d) 64

(12) The function $f : f(\theta) = \sin (b \theta)$ is a periodic function and its period $\left(\frac{2\pi}{3}\right)$, then b = ...

(a) $\frac{3}{4}$ (b) $\frac{5}{3}$ (c) 3 (d) 6

(13) In the opposite figure :

If $\overline{XY} // \overline{BC}$, then AC = ... cm.



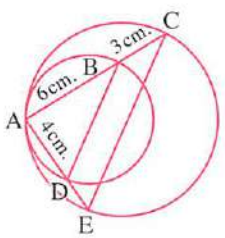
(a) 15 (b) 16

(c) 18 (d) 20

(14) In the opposite figure :

AB = 6 cm. , BC = 3 cm. , AD = 4 cm.

the two circles touching internally at A , then ED = ... cm.



(a) 2 (b) 3

(c) 3.5 (d) 4

(15) If $(2 + 3 i) + (1 - i) = \mathcal{X} + y i$, then $\mathcal{X} + y$ = ...

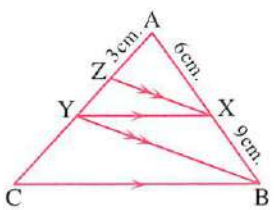
(a) 2 (b) – 4 (c) 5 (d) 7

(16) In the opposite figure :

$\overline{XY} // \overline{BC}$, $\overline{XZ} // \overline{BY}$

, AX = 6 cm. , XB = 9 cm. , AZ = 3 cm.

, then the length of $\overline{ZC}$ = ... cm.



(a) 4.5 (b) $15\frac{3}{4}$ (c) 36 (d) 45

(17) If S_1 is the solution set of the inequality : $x^2 - x - 2 \leq 0$ and S_2 is the solution set of the inequality : $x^2 + x - 2 \leq 0$, then $S_1 \cap S_2$ = ...

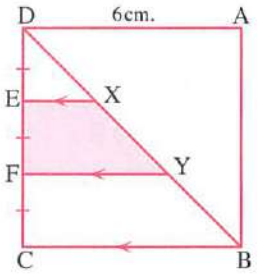
(a) $\varnothing$ (b) $[-2 , 2]$ (c) $[-1 , 1]$ (d) $\mathbb{R} -]-1 , 1[$

(18) In the opposite figure :

ABCD is a square of side length 6 cm.

, DE = EF = FC

, then the area of the polygon XYFE = ... cm^2



(a) 6 (b) 8

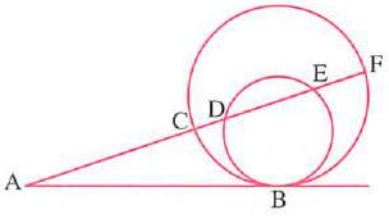
(c) 10 (d) 12

(19) The terminal side of angle θ in standard position intersects the unit circle at point $B\left(x , \frac{3}{5}\right)$ where $x < 0$, then $\sin(90° + \theta)$ = ...

(a) -0.8 (b) -0.6 (c) 0.8 (d) 0.6

(20) If $\overrightarrow{AB}$ is a common tangent to two circles touching internally at B

, then AC : AD = ...



(a) AB : AF (b) 3 : 4

(c) AD : AF (d) AE : AF

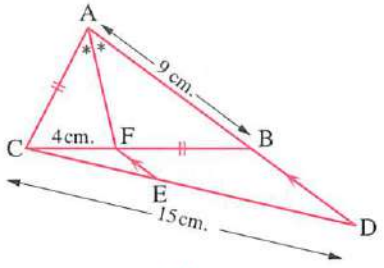
(21) In the opposite figure :

ABC is a triangle , $\overrightarrow{AF}$ bisects $\angle$ A internally

, AC = BF , $\overline{FE} // \overline{BD}$

, CD = 15 cm.

, CF = 4 cm. , AB = 9 cm. , then DE = ... cm.



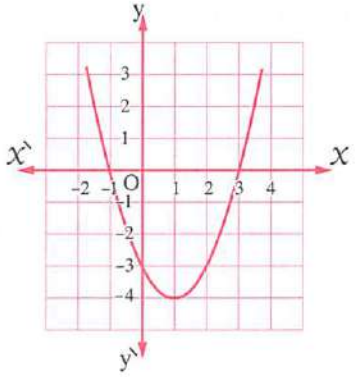
(a) 4 (b) 6 (c) 9 (d) 11

(22) In the opposite figure :

The curve of the function f : $f(x) = x^2 - 2x - 3$

, then the solution set of the inequality :

$x^2 - 2x - 3 \geq 0$ in $\mathbb{R}$ is .....



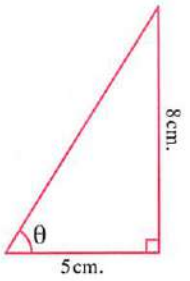
(a) $]-1 , 3[$ (b) $\mathbb{R} - [-1 , 3]$

(c) $]3 , \infty[$ (d) $]-\infty , -1] \cup [3 , \infty[$

(23) The dimensions of a rectangle are 10 cm. , 6 cm. , if the scale factor equals 3 , then the perimeter of another of rectangle similar to it = ... cm.

(a) 96 (b) 69 (c) 15 (d) 30

(24) In the opposite figure :

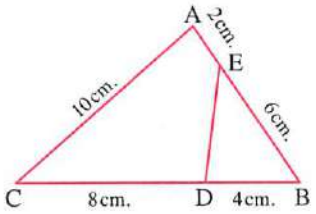


$\theta^{rad} \simeq$ .....

(a) 1.5^{rad} (b) 1.012^{rad}

(c) 2^{rad} (d) 4

(25) In the opposite figure :



If EB = 6 cm. , CD = 8 cm.

, AC = 10 cm

, AE = 2 cm. , BD = 4 cm.

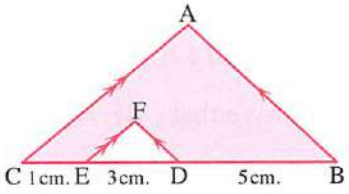
, then ED = ...

(a) 2 (b) 4 (c) 3 (d) 5

(26) If M is a circle with diameter length 12 cm. , A is a point in its plane and the power of the point A with respect to the circle M equals 13 cm. , then MA = ... cm.

(a) 7 (b) 14 (c) 3.5 (d) 6

(27) In the opposite figure :



If the area of Δ DEF = 6 cm^2

, then the area of shaded part = ... cm^2

(a) 27 (b) 36

(c) 48 (d) 54

(28) The range of the function f : $f(\theta) = 3 \sin 2\theta$ is .....

(a) $[-2 , 2]$ (b) $]-2 , 2[$ (c) $[-3 , 3]$ (d) $]-3 , 3[$

Second Essay questions

Answer the following questions :

1 If $\cos \chi = \frac{3}{5}$, $270° < \chi < 360°$ Find the value of :

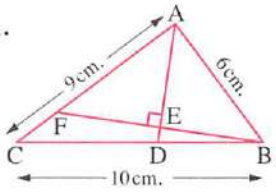
$\sin(180° - \chi) + \tan(90° - \chi) + \tan(270° - \chi)$

2 **In the opposite figure :**

ABC is a triangle in which AB = 6 cm. , AC = 9 cm. and BC = 10 cm.

, $D \in \overline{BC}$ where BD = 4 cm. , $\overrightarrow{BE} \perp \overline{AD}$

and intersects $\overline{AD}$ and $\overline{AC}$ at E and F respectively.



(1) **Prove that :** $\overrightarrow{AD}$ bisect $\angle A$

(2) **Find :** area of ΔABF : area of ΔCBF

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3 Find in $\mathbb{R}$ the solution set of the inequality : $(X + 3)^2 < 10 - 3(X + 3)$

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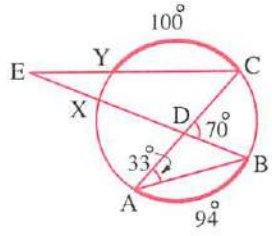
4 **In the opposite figure :**

$m(\angle BAC) = 33°$, $m(\angle BDC) = 70°$

, $m(\overset{\frown}{AB}) = 94°$

, $m(\overset{\frown}{CY}) = 100°$

Find : $m(\angle BEC)$

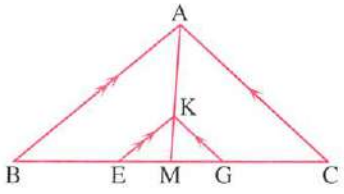


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5 ABC is a triangle , M is the midpoint of $\overline{BC}$, let $K \in \overline{AM}$

, draw $\overrightarrow{KE} // \overline{AB}$ to intersect $\overline{BC}$ at E , draw $\overrightarrow{KG} // \overline{AC}$

to intersect $\overline{BC}$ at G.



First : Prove that : M is the midpoint of $\overline{EG}$.

Second : If K is the point of intersection of the medians of ΔABC

Prove that : $BE = EG = GC = \frac{1}{3} BC$

9 El-Gharbia Governorate

Central Mathematics Supervision
Official Language Schools

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $\tan(180° + \theta) = 1$ where θ is the smallest positive angle , then θ = ...

(a) 60° (b) 30° (c) 45° (d) 135°

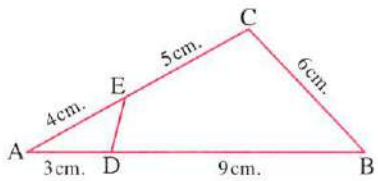
(2) If L , – L are the two roots of the equation : $X^2 - (k - 7)X - 25 = 0$

, then k = ...

(a) 3 (b) 5 (c) 7 (d) 9

(3) In the opposite figure :

ED = ... cm.

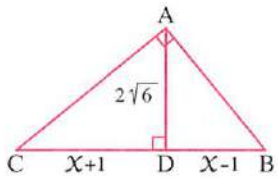


(a) 2 (b) 3

(c) 4 (d) 5

(4) In the opposite figure :

AD = $2\sqrt{6}$ cm. , then the value of x = ...



(a) 3 (b) 4

(c) 5 (d) 6

(5) i^{-24} = ...

(a) 1 (b) – 1 (c) i (d) – i

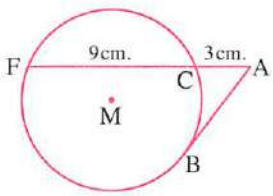
(6) If the function $y = \sin\left(\frac{\pi}{2} + x\right)$ has the maximum value at x = ...

(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) π (d) zero

(7) In the opposite figure :

AC = 3 cm. , CF = 9 cm. , $\overline{AB}$ touches the circle M at B

, then $P_M(A)$ = ...

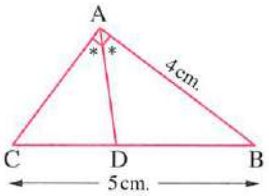


(a) 6 (b) 9

(c) 27 (d) 36

(8) In the opposite figure :

BC = 5 cm. , AB = 4 cm. , $\overline{AB} \perp \overline{AC}$, then $\frac{BD}{DC}$ = ...



(a) $\frac{4}{5}$ (b) $\frac{3}{5}$

(c) $\frac{3}{4}$ (d) $\frac{4}{3}$

(9) The solution set of the equation : $x^2 + 9 = 0$ in the set of complex number is .....

(a) $\{3 , -3\}$ (b) $\{-3i\}$ (c) $\{3i , -3i\}$ (d) $\varnothing$

(10) The degree measure of the angle whose measure $\frac{7\pi}{6}$ = ...

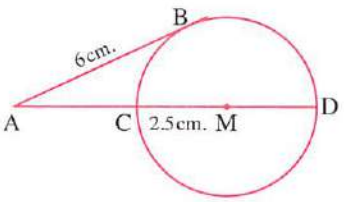
(a) 105° (b) 210° (c) 420° (d) 840°

(11) In the opposite figure :

$\overline{AB}$ is a tangent segment to circle M

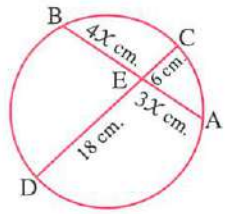
, AB = 6 cm. , CM = 2.5 cm.

, then AC = ... cm.



(a) 9 (b) 4 (c) 2.5 (d) 5

(12) In the opposite figure :



X = ... cm.

(a) 3 (b) 9

(c) 2 (d) 18

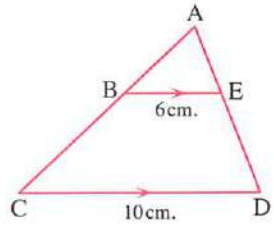
(13) The two roots of the equation : $k X^2 - 12 X + 9 = 0$ are equal if .....

(a) $k > 4$ (b) $k < 4$ (c) $k = 4$ (d) $k = 9$

(14) The angle with measure 585° in standard position is equivalent to the angle with measure .....

(a) $\frac{\pi}{4}$ (b) $\frac{5\pi}{4}$ (c) $\frac{3\pi}{4}$ (d) $\frac{7\pi}{4}$

(15) In the opposite figure :

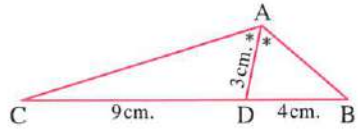


If $\overline{BC} \parallel \overline{DC}$, then $\frac{\text{area of } \Delta ABE}{\text{area of trapezium BCDE}}$ = ...

(a) $\frac{25}{81}$ (b) $\frac{3}{5}$

(c) $\frac{9}{16}$ (d) $\frac{9}{25}$

(16) In the opposite figure :



$AB \times AC$ = ... cm^2

(a) 36 (b) 45

(c) 12 (d) 27

(17) If $\tan(4\theta) = \cot(5\theta)$, then $\sin(3\theta)$ = ... where 3θ is the measure of acute angle.

(a) $\frac{1}{2}$ (b) 1 (c) -1 (d) $\frac{\sqrt{3}}{2}$

(18) If $(2 + 3i) + (1 - i) = X + y i$, then $X + y$ = ...

(a) 2 (b) -4 (c) 5 (d) 6

(19) All ..... are simialr.

(a) triangles (b) rectangle (c) parallelograms (d) squares

(20) The length of an arc opposite to a central angle of measure 150° in a circle with radius length 8 cm. equals ..... cm.

(a) $\frac{20}{3}\pi$ (b) $\frac{17}{2}\pi$ (c) 8π (d) 20

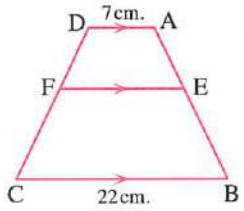
(21) The quadratic equation whose roots $\frac{3}{i}$, $\frac{3+3i}{1-i}$ is .....

(a) $X^2 - 3X + 9 = 0$ (b) $X^2 + 9 = 0$ (c) $X^2 + 9X + 9 = 0$ (d) $X^2 = 9$

(22) If the degree measure of an angle is $64° 48\grave{}$, then its radian measure is .....

(a) 0.18^{rad} (b) 0.36^{rad} (c) 11.3^{rad} (d) $\frac{9}{25}\pi$

(23) In the opposite figure :

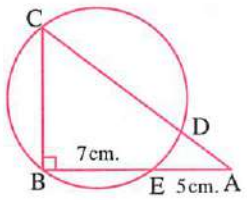


If $\frac{AE}{EB} = \frac{2}{3}$, then FE = ... cm.

(a) 9 (b) 11

(c) 13 (d) 15

(24) In the opposite figure :



BC = 9 cm.

, then DC = ... cm.

(a) 9 (b) 10

(c) 11 (d) 12

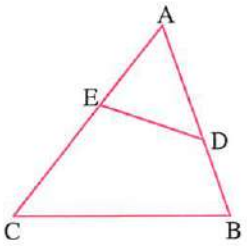
(25) The sign of the function $f : f(x) = 7 - x$ is negative in the interval .....

(a) $]-\infty , 7[$ (b) $]-\infty , \infty[$ (c) $]7 , \infty[$ (d) $]-7 , 7[$

(26) If $\sin\theta = -\frac{1}{2}$, $\cos\theta = \frac{\sqrt{3}}{2}$, then θ = ...

(a) 30° (b) 150° (c) 210° (d) 330°

(27) In the opposite figure :



$\Delta ABC \sim \Delta AED$ if AD = 3 cm. , BD = 2 cm.

, AE = 2.5 cm. , then EC = ... cm.

(a) 2.5 (b) 3

(c) 4.5 (d) 3.5

(28) $(1 - i)^{12}$ = ...

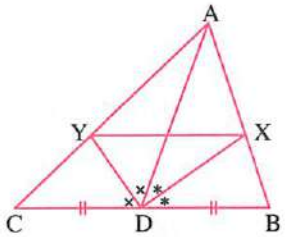
(a) $-64\,i$ (b) $64\,i$ (c) -64 (d) 64

Second Essay questions

Answer the following questions :

1 Find the solution set of the inequality : $x^2 - 5x + 6 \leq 0$ in $\mathbb{R}$

2 In the opposite figure :



$\overline{AD}$ is the median of ΔABC

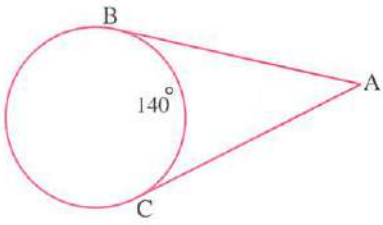
, $\overrightarrow{DX}$ bisects $\angle ADB$

, $\overrightarrow{DY}$ bisects $\angle ADC$

Prove that : $\overline{XY} // \overline{BC}$

3 Prove that : $\sin 60° \cos 30° - \cos 60° \sin 30° = \sin^2 \frac{\pi}{4}$

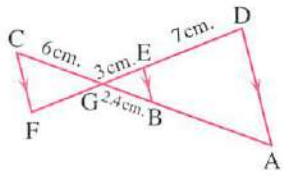
4 $\overline{AB}$, $\overline{AC}$ are two tangents to the circle m $(\overset{\frown}{BC}) = 140°$, find m $(\angle A)$



5 **In the opposite figure :**

$\overline{AD} // \overline{BE} // \overline{FC}$ and $\overleftrightarrow{AC}$, $\overleftrightarrow{DF}$ are two transversal intersect at G

Find the length of each of $\overline{GF}$, $\overline{GA}$



10 El-Fayoum Governorate — Directorate of Education

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The conjugate of the number $(3\,i - 4)$ is .....

(a) $3\,i + 4$ (b) $-3\,i - 4$ (c) $-3\,i + 4$ (d) $3\,i - 4$

(2) The two roots of the equation : $x^2 - 5x + 11 = 0$ are .....

(a) two complex and non-real roots. (b) two rational roots.

(c) two different real roots. (d) two equal real roots.

(3) The sum of the two roots of the equation : $4x^2 + 4x - 35 = 0$ is .....

(a) -1 (b) -4 (c) 1 (d) $\frac{-35}{4}$

(4) If L and M are the two roots of the equation : $x^2 - 4x + 1 = 0$, then the value of $L^2 - 4L + 1$ = ...

(a) 0 (b) -4 (c) 1 (d) -1

(5) The sign of the function f : $f(x) = 6 - 2x$ is positive at .....

(a) $x > 3$ (b) $x \leq 3$ (c) $x < 3$ (d) $x \geq 3$

(6) If one of the two roots of the equation : $x^2 - (b - 3)x + 5 = 0$ is the additive inverse of the other root , then b = ...

(a) -5 (b) -3 (c) 3 (d) 5

(7) $\sqrt{-16}$ = ...

(a) -4 (b) 4 (c) $2\,i$ (d) $4\,i$

(8) The angle of measure 1670° lies in the ..... quadrant.

(a) first. (b) second. (c) third. (d) fourth.

(9) In a circle of diameter length 12 cm. , the length of the arc subtended by a central angle of measure 60° equals ..... cm.

(a) 5π (b) 4π (c) 3π (d) 2π

(10) If $\csc\theta = 2$, where θ is a positive acute angle , then the measure of angle θ = ...

(a) 15° (b) 30° (c) 45° (d) 60°

(11) The simplest form of the expression : $\tan(90° - \theta) + \tan(90° + \theta)$ is .....

(a) $2\cot\theta$ (b) $2\tan\theta$ (c) zero (d) $\tan\theta + \cot\theta$

(12) The range of the function $f : f(x) = \cos 5\theta$ is .....

(a) $\{5 , -5\}$ (b) $[-1 , 1]$ (c) $]-5 , 5[$ (d) $[-5 , 5]$

(13) If K is the scale factor of similarity of polygon M_1 to polygon M_2 and $0 < K < 1$, then the polygon M_1 is ..... to polygon M_2

(a) congruent to (b) enlargement

(c) minimization (d) of double area

(14) In the opposite figure :

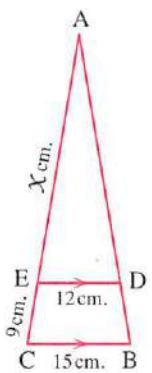
x = ... cm.

(a) 12

(b) 24

(c) 36

(d) 48



(15) The ratio between the perimeters of two similar polygons is 4 : 9 , so the ratio between their areas is .....

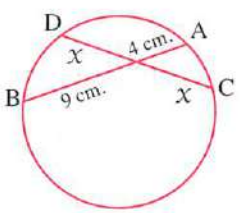
(a) 4 : 9 (b) 9 : 4 (c) 2 : 3 (d) 16 : 81

(16) In the opposite figure :

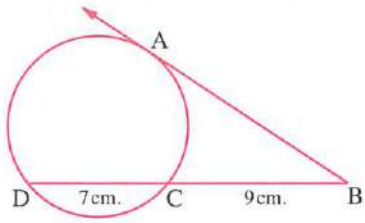
x = ...

(a) 6 (b) – 6

(c) ± 6 (d) 36



(17) In the opposite figure :

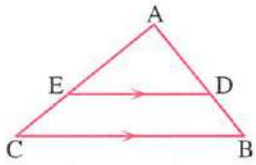


AB = ... cm.

(a) 63 (b) 144

(c) 12 (d) $\frac{9}{16}$

(18) In the opposite figure :

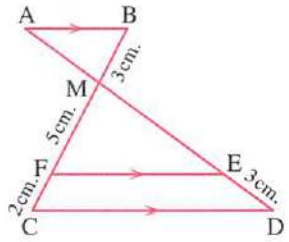


If $\frac{AD}{DB} = \frac{5}{3}$, then $\frac{AB}{BD}$ = ...

(a) $\frac{3}{5}$ (b) $\frac{8}{3}$

(c) $\frac{3}{8}$ (d) $\frac{5}{8}$

(19) In the opposite figure :

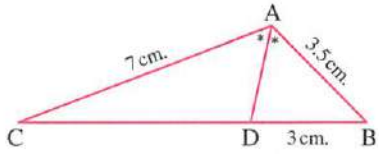


AE = ... cm.

(a) 6 (b) 7.5

(c) 10 (d) 12

(20) In the opposite figure :



CD = ... cm.

(a) 4.5 (b) 5

(c) 4.9 (d) 6

(21) In the opposite figure :



θ = ...

(a) 10°

(b) 20°

(c) 40°

(d) 80°

(22) If M is a circle of radius length 3 cm. , A is a point lies in its plane where MA = 4 cm. , then $P_M(A)$ = ...

(a) $\sqrt{7}$ (b) 9 (c) 7 (d) – 7

(23) The product of the two roots of the equation : $3x^2 - 4 = 0$ multiplying by the sum of the two roots of the equation : $x^2 - 3x = 0$ is .....

(a) 12 (b) – 3 (c) – 4 (d) 3

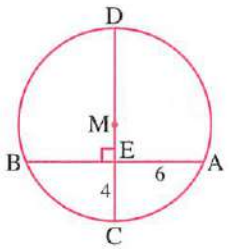
(24) The function $f : f(x) = -3$ is negative in the interval .....

(a) $]-\infty , 3[$ only.
(b) $]-3 , 3[$ only.
(c) $]-\infty , \infty[$
(d) $]-2 , 2[$ only.

(25) In the opposite figure :

The radius length

of the circle = ... cm.



(a) 9
(b) 4.5
(c) 6
(d) 6.5

(26) Two similar polygons , the ratio between their perimeters equal 4 : 9 , then the ratio between the lengths of two corresponding sides is .....

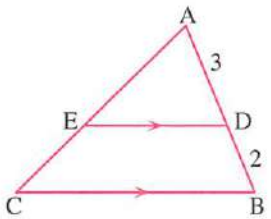
(a) 4 : 9
(b) 2 : 3
(c) 16 : 81
(d) 9 : 4

(27) If $\Delta ABC \sim \Delta DEF$, $BC = 3\ EF$, then the scale factor of similarity of the two triangle = ...

(a) $\frac{2}{3}$
(b) $\frac{1}{2}$
(c) 1
(d) 3

(28) In the opposite figure :

If $\overline{DE} // \overline{BC}$, then $\frac{\text{The area of } (\Delta ADE)}{\text{The area of } (\Delta ABC)}$ = ...



(a) $\frac{3}{2}$
(b) $\frac{9}{4}$
(c) $\frac{9}{25}$
(d) $\frac{3}{5}$

Second Essay questions

Answer the following questions :

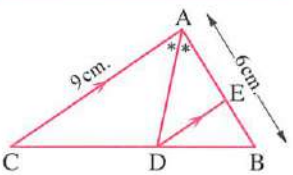
1 Find in $\mathbb{R}$ the solution set of the inequality : $x(x+2) - 3 \leq 0$

2 Find the value of : $\cos 90° \csc 30° + \sec^2 45° \sin 30° - \cos 270° \sin 180°$

3 **In the opposite figure :**

$\overrightarrow{AD}$ bisect $\angle BAC$, $\overline{ED} // \overline{AC}$

Prove that : $\frac{BE}{EA} = \frac{BA}{AC}$



and if AC = 9 cm. , AB = 6 cm. **find the length of each of :** $\overline{AE}$ and $\overline{BE}$

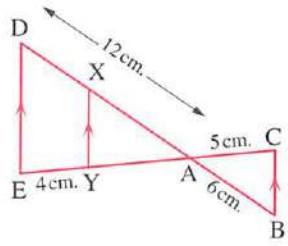
4 **In the opposite figure :**

$\overline{CE} \cap \overline{BD} = \{A\}$, $X \in \overline{AD}$, $Y \in \overline{AE}$, where

$\overline{XY} \,//\, \overline{BC} \,//\, \overline{ED}$, if AB = 6 cm. , AC = 5 cm.

, AD = 12 cm. and EY = 4 cm.

Find the length of each of : $\overline{AE}$ and $\overline{DX}$



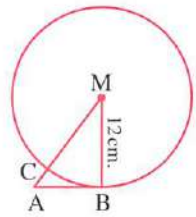
5 **In the opposite figure :**

$\overline{AB}$ is a tangent to the circle M at B , $\overline{MA}$ intersects the circle M at C

If the radius length of the circle equals 12 cm. , $P_M(A) = 81$

, then find : (1) The length of $\overline{AB}$

(2) The length of $\overline{AC}$



Model 1

Interactive test 1

First Multiple choice questions

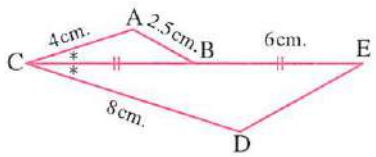
Choose the correct answer from the given ones :

1 If $\tan(180° + \theta) = 1$ where θ is the smallest positive angle , then θ = ...

(a) 60° (b) 30° (c) 45° (d) 135°

2 **In the opposite figure :**

If B is the midpoint of $\overline{CE}$, then DE = ... cm.



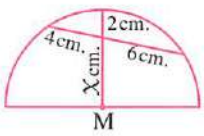
(a) 4 (b) 5

(c) 6 (d) 7

3 **In the opposite figure :**

M is the centre of semi-circle

, then $\mathcal{X}$ = ...



(a) 5 (b) 7 (c) 8 (d) 12

4 The solution set of the inequality $(\mathcal{X} - 3)(\mathcal{X} - 7) < 0$ in $\mathbb{R}$ is .....

(a) $\{3 , 7\}$ (b) $]3 , 7[$ (c) $[3 , 7]$ (d) $\mathbb{R} - [2 , 5]$

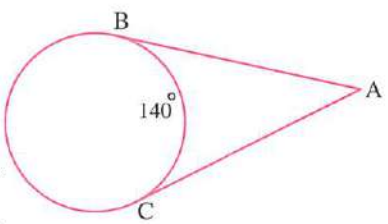
5 The exterior bisector at the vertex of an isosceles triangle ..... to the base.

(a) parallel (b) perpendicular (c) bisects (d) equal

6 **In the opposite figure :**

$\overline{AB}$, $\overline{AC}$ are two tangents to the circle

$m(\overset{\frown}{BC}) = 140°$, then $m(\angle A)$ = ...



(a) 30° (b) 40°

(c) 60° (d) 80°

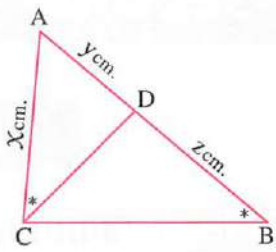
7 The roots of the equation : $k\mathcal{X}^2 - 12\mathcal{X} + 9 = 0$ are equal if .....

(a) $k > 4$ (b) $k < 4$ (c) $k = 4$ (d) $k = 9$

8 **In the opposite figure :**

If $x^2 - y^2 = 16$

, then y z = ...



(a) 4 (b) 8

(c) 12 (d) 16

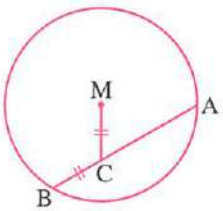
9 The simplest form of the imaginary number i^{42} is .....

(a) 1 (b) – 1 (c) i (d) – i

10 **In the opposite figure :**

The diameter of circle M is 12 cm. , MC = CB and AC = (BC + 1) cm.

, then AB = ... cm.



(a) 4 (b) 6

(c) 8 (d) 9

11 The degree measure of the angle whose measure $\frac{7\pi}{6}$ equals .....

(a) 105° (b) 210° (c) 420° (d) 840°

12 ABC is a right-angled triangle at A , $\overline{AD} \perp \overline{BC}$ where $D \in \overline{BC}$, then $(AB)^2$ = ...

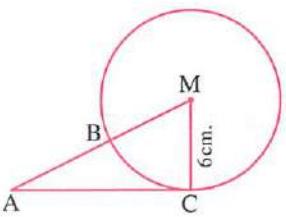
(a) BD × BC (b) BD × DC (c) CD × CB (d) AB × AC

13 **In the opposite figure :**

$\overline{AC}$ touches the circle M at C , MC = 6 cm.

, $P_M(A) = 64$

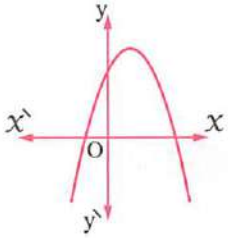
, then AB = ... cm.



(a) 3 (b) 4

(c) 5 (d) 6

14 The opposite figure represents the curve $y = a x^2 + b x + c$ which of the following is true ?



(a) a > 0 , c > 0

(b) a > 0 , c < 0

(c) a < 0 , c > 0

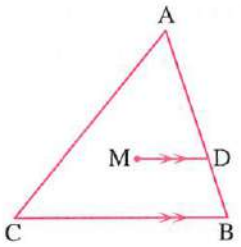
(d) a < 0 , c < 0

15 **In the opposite figure :**

If M is the point of concurrence of medians of Δ ABC , and $\overline{DM} \parallel \overline{BC}$, then $\frac{DM}{BC}$ = ...

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{2}{3}$ (d) $\frac{1}{4}$



16 If A and B are the measures of two equivalent angles which of the following represents two equivalent angles also where $C \in \mathbb{Z}$?

(a) (A + C) , (B + C) (b) (A – C) , (B – C)

(c) (CA) , (CB) (d) All the previous.

17 If the curve $y = x(a - x)$, which of the following statements is true ?

[1] The curve intersects x-axis at (0 , 0) , (a , 0)

[2] The vertex of the curve is $\left(\frac{a}{2} , \frac{a^2}{4}\right)$

[3] The axis of symmetry of the curve is $x = a$

(a) **[1]** , **[2]** only (b) **[1]** , **[3]** only

(c) **[2]** , **[3]** only (d) **[1]** , **[2]** and **[3]**

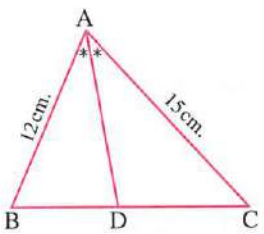
18 **In the opposite figure :**

If area of Δ ABC = 72 cm^2

, then area of Δ ADB = ... cm^2

(a) 24 (b) 28

(c) 32 (d) 40



19 If L , M are the two roots of the equation : $x^2 - 5x + 6 = 0$, then the quadratic equation whose roots are L + 1 , M + 1 is .....

(a) $x^2 - 7x + 8 = 0$ (b) $(x + 1)^2 - 5(x + 1) + 6 = 0$

(c) $x^2 - 7x + 12 = 0$ (d) $x^2 + 7x - 10 = 0$

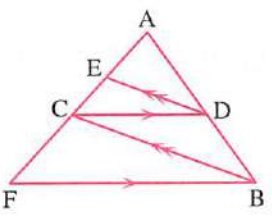
20 **In the opposite figure :**

$\overline{DE} \parallel \overline{BC}$, $\overline{DC} \parallel \overline{BF}$

, then AE × AF = ...

(a) $(AC)^2$ (b) AD × AB

(c) AE × AC (d) AC × AB



21 ABC is right-angled triangle at B , draw $\overrightarrow{AD}$ to bisect $\angle A$ and intersects $\overline{BC}$ at D , if the length of $\overline{BD}$ = 24 cm. , BA : AC = 3 : 5 , then the perimeter of ΔABC = ... cm.

(a) 177 (b) 192 (c) 213 (d) 184

22 If the ratio between the perimeters of two similar polygons is 4 : 9 , then the ratio between their areas .....

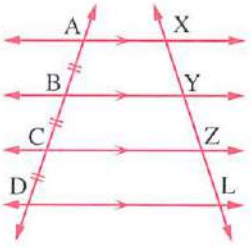
(a) 2 : 3 (b) 4 : 13 (c) 16 : 81 (d) 4 : 9

23 **In the opposite figure :**

$\overleftrightarrow{XA} // \overleftrightarrow{YB} // \overleftrightarrow{ZC} // \overleftrightarrow{LD}$, $\overleftrightarrow{XL}$, $\overleftrightarrow{AD}$ are two transversals

, if XZ = 7 cm.

, then XL = ... cm.



(a) 7 (b) 10

(c) 3.5 (d) 10.5

24 The solution set of the inequality $\mathcal{X}(\mathcal{X}-1) > 0$ in $\mathbb{R}$ is .....

(a) $\{0 , 1\}$ (b) $]0 , 1[$ (c) $[0 , 1]$ (d) $\mathbb{R} - [0 , 1]$

25 The minimum value of the function f : $f(\theta) = 5 \cos 7\theta$ is .....

(a) 5 (b) zero (c) – 5 (d) – 7

26 If $\sin\theta = -\frac{1}{2}$, $\tan\theta > 0$, then θ = ...

(a) 30° (b) 150° (c) 210° (d) 330°

27 If f : $f(\mathcal{X}) = a\mathcal{X}^2 + b\mathcal{X} + c$ is positive for all real values of $\mathcal{X}$, then .....

(a) $b^2 - 4ac < 0$ (b) $b^2 - 4ac > 0$

(c) $b^2 - 4ac = 0$ (d) $b^2 - 4ac \leq 0$

28 If one of the two roots of the equation : $a\mathcal{X}^2 - 3\mathcal{X} + 2 = 0$ is the multiplicative inverse of the other root , then a = ...

(a) $\frac{1}{2}$ (b) 3 (c) 2 (d) – 2

Second Essay questions

Answer the following questions :

1 In Δ ABC , D $\in \overline{AB}$ where AD = 5 cm. , DB = 3 cm.

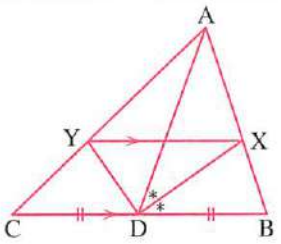
, E $\in \overline{AC}$ where AE = 4 cm. , EC = 6 cm.

Prove that :

[1] Δ ADE ~ Δ ACB [2] DBCE is a cyclic quadrilateral.

2 Investigate the sign of the function $f : f(X) = X^2 + 3X - 10$ and illustrate it on a number line , then determine the solution set of the inequality : $X^2 + 3X \leq 10$

3 **In the opposite figure :**



[1] Prove that : $\overrightarrow{DY}$ bisects $\angle$ ADC

[2] Find : m ($\angle$ XDY)

4 If $\cos X = \frac{3}{5}$, $270° < X < 360°$

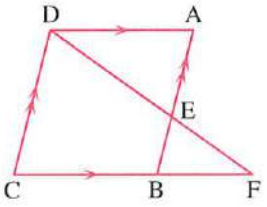
Find the value of : $\sin(180° - X) + \tan(90° - X) + \tan(270° - X)$

5 **In the opposite figure :**

ABCD is a parallelogram

, E $\in \overline{AB}$ where $\frac{AE}{EB} = \frac{3}{2}$

, $\overrightarrow{DE} \cap \overrightarrow{CB} = \{F\}$



[1] Prove that : Δ DCF ~ Δ EAD

[2] Find : $\frac{a(\Delta DCF)}{a(\Delta EAD)}$

Model 2

Interactive test 2

First Multiple choice questions

Choose the correct answer from the given ones :

1 The triangle in which the measure of two angles are 50° , 60° is similar to the triangle in which the measure of two angles are 60° , ...

(a) 70° (b) 110° (c) 80° (d) 30°

2 If L , 2 – L are the roots of the equation : $\mathcal{X}^2 + k\,\mathcal{X} + 6 = 0$, then k = ...

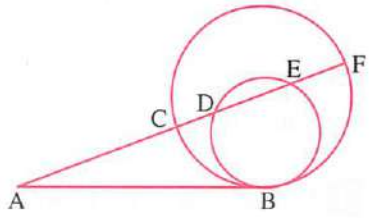
(a) 1 (b) – 2 (c) 3 (d) 5

3 The function $f : f(\mathcal{X}) = (\mathcal{X} - 1)(\mathcal{X} + 3)$ is positive in the interval .....

(a) $[-3 , 1]$ (b) $]-3 , 1[$ (c) $\mathbb{R} - [-3 , 1]$ (d) $\mathbb{R} -]-3 , 1[$

4 **In the opposite figure :**

If $\overline{AB}$ is a common tangent to two circles touching externally at B , then AC : AD = ... : .....

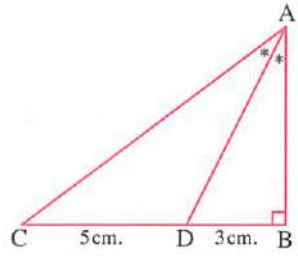


(a) AB : AF (b) AF : AE

(c) AD : AF (d) AE : AF

5 **In the opposite figure :**

AB = ... cm.



(a) 4 (b) 5

(c) 6 (d) 7

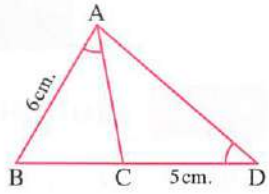
6 If a , b are two rational numbers , then the two roots of the equation : $a\,\mathcal{X}^2 + b\,\mathcal{X} + b - a = 0$ are .....

(a) complex and non-real. (b) complex conjugate.

(c) rationals. (d) equal.

7 **In the opposite figure :**

$C \in \overline{BD}$, m (∠ D) = m (∠ BAC) , AB = 6 cm. , CD = 5 cm. , then BC = ... cm.



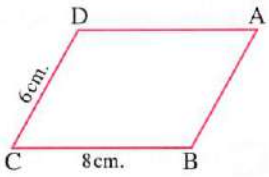
(a) 3 (b) 4 (c) 5 (d) 6

8 **In the opposite figure :**

ABCD is a parallelogram

, its area = 40 cm^2

, then m ($\angle$ A) $\simeq$ .....



(a) 37° (b) 56° (c) 53° (d) 34°

9 If P_M (A) = P_N (A) where M , N are two circles , then .....

(a) AM = AN

(b) The radius length of M = the radius length of N

(c) A lies on the line of intersection of the two circles.

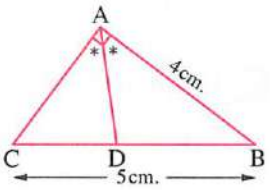
(d) A lies on the principle axis of the two circles M , N

10 **In the opposite figure :**

BC = 5 cm. , AB = 4 cm. , $\overline{AB} \perp \overline{AC}$, then $\frac{BD}{DC}$ = ...

(a) $\frac{4}{5}$ (b) $\frac{3}{5}$

(c) $\frac{3}{4}$ (d) $\frac{4}{3}$



11 The arc length in a circle of raduis 6 cm. opposite to central angle of measure $\frac{\pi}{2}$ is .....

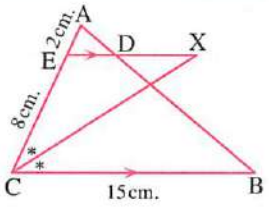
(a) $\frac{3\pi}{2}$ cm. (b) 2 π cm. (c) $\frac{5\pi}{2}$ cm. (d) 3 π cm.

12 **In the opposite figure :**

If $\overrightarrow{CX}$ bisects $\angle$ ACB , $\overline{XD}$ // $\overline{BC}$, then XD = ... cm.

(a) 3 (b) 4

(c) 5 (d) 6



13 If ABC is right-angled triangle at B , sin A + cos C = 1 , then tan C = ...

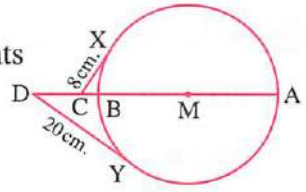
(a) 1 (b) – 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{3}$

14 **In the opposite figure :**

If $\overline{AB}$ is a diameter in circle M , $\overline{CX}$, $\overline{YD}$ are two tangent segments to the circle M , AB = 30 cm. , CX = 8 cm.

, DY = 20 cm. , then DC = ... cm.

(a) 2 (b) 6 (c) 8 (d) 10

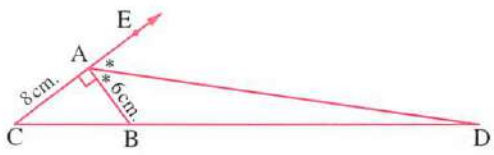


15 The solution set of the equation : $x^2 + 9 = 0$ in the set of complex numbers is .....

(a) $\{3 , -3\}$ (b) $\{-3i\}$ (c) $\{3i , -3i\}$ (d) $\varnothing$

16 **In the opposite figure :**

The area of Δ ABD = ... cm^2



(a) 36 (b) 48

(c) 54 (d) 72

17 If the solution set of the inequality : $x^2 - 4 \leq x + k$ is $[-2 , 3]$, then k = ...

(a) -6 (b) 1 (c) 2 (d) 10

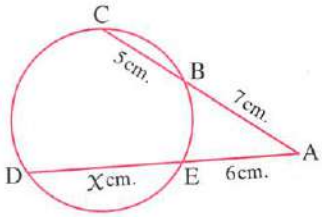
18 The range of the function f : $f(\theta) = 3 \sin 2\theta$ is .....

(a) $[-2 , 2]$ (b) $]-2 , 2[$ (c) $[-3 , 3]$ (d) $]-3 , 3[$

19 **In the opposite figure :**

AB = 7 cm. , BC = 5 cm. , AE = 6 cm.

, DE = x cm. , then the value of x = ...



(a) 5 (b) 14

(c) 12 (d) 8

20 A is a point outside the circle M , $\overleftrightarrow{AB}$ is a tangent to the circle at B , draw $\overleftrightarrow{AD}$ to intersect the circle at C and D where C $\in \overline{AD}$, if m $(\overset{\frown}{DB}) = 150°$, m $(\overset{\frown}{BC}) = 80°$

, then m $(\angle A)$ = ... °

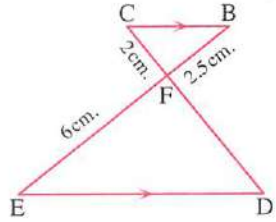
(a) 115 (b) 35 (c) 70 (d) 60

21 The terminal side of angle θ in standard position intersects the unit circle at point B $\left(x , \frac{3}{5}\right)$ where $x < 0$, then sin $(90° + \theta)$ = ...

(a) -0.8 (b) -0.6 (c) 0.8 (d) 0.6

22 **In the opposite figure :**

FD = ... cm.



(a) 3.6 (b) 4

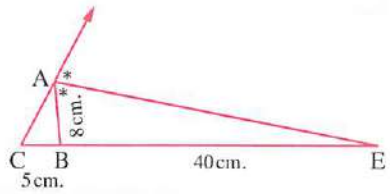
(c) 4.2 (d) 4.8

23 **In the opposite figure :**

AE = ... cm.

(a) 32 (b) 45

(c) 48 (d) $24\sqrt{3}$



24 If $\sin \mathcal{X} = \cos y$, then $\sin (\mathcal{X} + y)$ = ...

(a) 1 (b) zero (c) – 1 (d) otherwise.

25 If one of the roots of the equation : $\mathcal{X}^2 - (m + 3)\,\mathcal{X} + 3 = 0$ is additive inverse of the other , then m = ...

(a) 3 (b) – 3 (c) zero (d) otherwise.

26 The two roots of the equation : $a\,\mathcal{X}^2 + b\,\mathcal{X} + c = 0$ are real equal if b^2 = ...

(a) 2 a c (b) a c (c) 4 a c (d) – 4 a c

27 If L , M are the two roots of the equation : $\mathcal{X}^2 + \mathcal{X} + 1 = 0$, then L + M + LM = ...

(a) zero (b) 1 (c) – 1 (d) 2

28 If $\mathcal{X} + y\,i = (2 - 3\,i)^2$, then $\mathcal{X} + y$ = ...

(a) – 5 – 12 i (b) – 17 (c) 17 (d) 60

Second Essay questions

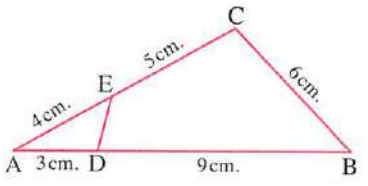
Answer the following questions :

1 **In the opposite figure :**

$E \in \overline{AC}$, $D \in \overline{AB}$ where AD = 3 cm.

, DB = 9 cm. , BC = 6 cm. , EC = 5 cm. , EA = 4 cm.

Prove that : $\Delta ADE \sim \Delta ACB$, then find the length of $\overline{ED}$



2 Find the general solution of the equation : $\tan (\theta + 20°) = \cot (3\,\theta + 30°)$

, then find the values of $\theta \in]0°\ , 90°[$

3 In ΔABC , $\overrightarrow{AD}$ bisects the interior angle and intersects $\overline{BC}$ at D , if AC = 15 cm.

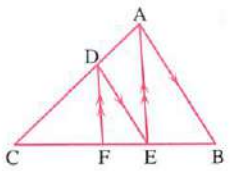
, AB = 27 cm. , BD = 18 cm. , calculate the lengths of $\overline{CD}$ and $\overline{AD}$

4 Find the values of $\mathcal{X}$, y that satisfy the equation : $\dfrac{(4 - 3\,i)\,(4 + 3\,i)}{2 + i} = \mathcal{X} + y\,i$

5 **In the opposite figure :**

ABC is a triangle , $D \in \overline{AC}$

, $\overline{DE} \parallel \overline{AB}$, $\overline{DF} \parallel \overline{AE}$ **Prove that :** $(CE)^2 = CF \times CB$



Model 3

Interactive test 3

First Multiple choice questions

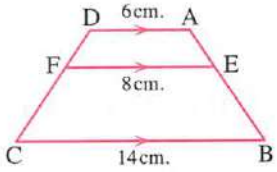
Choose the correct answer from the given ones :

1 The simplest form of the imaginary number i^{73} = ...

(a) -1 (b) 1 (c) i (d) $-i$

2 **In the opposite figure :**

$\frac{AE}{EB}$ = ...



(a) $\frac{3}{4}$ (b) $\frac{4}{7}$

(c) $\frac{3}{7}$ (d) $\frac{1}{3}$

3 If one of the two roots of the equation : $x^2 - (m + 2)x + 3 = 0$ is additive inverse of the other , then m = ...

(a) -3 (b) -2 (c) 2 (d) 3

4 If polygon M_1 is magnification of polygon M_2 and k is the ratio of magnification , then .....

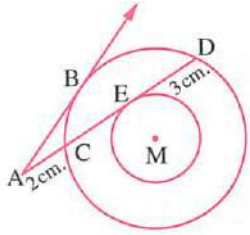
(a) $k > 1$ (b) $k < 1$ (c) $k = 0$ (d) $0 < k < 1$

5 The solution set of the equation $x^2 = x$ in $\mathbb{R}$ is .....

(a) $\{0\}$ (b) $\{1\}$ (c) $\{-1 , 1\}$ (d) $\{0 , 1\}$

6 **In the opposite figure :**

AB = ... cm.



(a) 4 (b) 5

(c) 6 (d) 8

7 If $\overleftrightarrow{AB}$ is a tangent to circle M at point B and $P_M(A) = 25\ cm^2$, then AB = ... cm.

(a) 5 (b) 10 (c) 15 (d) 25

8 If L , M are the two roots of the quadratic equation $(\mathcal{X} - a)(\mathcal{X} - b) = k$, then the quadratic equation whose roots a , b is .....

(a) $(\mathcal{X} - L)(\mathcal{X} - M) = 0$ (b) $(\mathcal{X} - L)(\mathcal{X} - M) + k = 0$

(c) $(\mathcal{X} - L)(\mathcal{X} - M) = k$ (d) $\mathcal{X}^2 - (L + M)\mathcal{X} + k = 0$

9 The radian measure of central angle opposite to an arc of length 3 cm. in a circle its diameter length 4 cm. is .....

(a) $\left(\frac{2}{3}\right)^{rad}$ (b) $\left(\frac{3}{2}\right)^{rad}$ (c) 5^{rad} (d) 6^{rad}

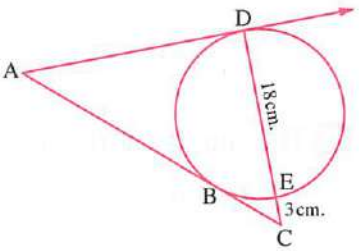
10 In the opposite figure :

$\overrightarrow{AD}$, $\overrightarrow{AB}$ are two tangents to the circle at D , B respectively.

$\overrightarrow{CE}$ intersects the circle at E , D

If CE = 3 cm. , ED = 18 cm.

, then (AC – AD) = ... cm.

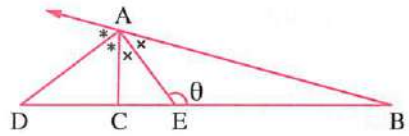


(a) $\sqrt{7}$ (b) $2\sqrt{7}$ (c) $3\sqrt{7}$ (d) $6\sqrt{7}$

11 In the opposite figure :

If AD = 8 cm. , AE = 6 cm.

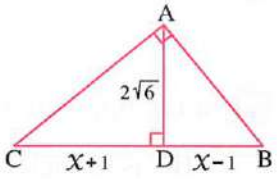
, then $\tan\theta$ = ...



(a) $\frac{-4}{3}$ (b) $\frac{-3}{4}$ (c) $\frac{3}{4}$ (d) $\frac{4}{3}$

12 In the opposite figure :

By using the shown givens , then $\mathcal{X}$ = ...



(a) 5 (b) 12

(c) 10 (d) 2.5

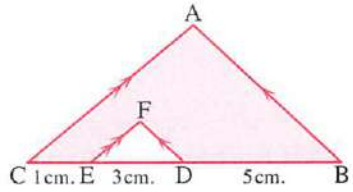
13 If $\sin\theta = \cos\theta$ where θ is the measure of an acute positive angle , then $\tan 2\theta$ = ...

(a) 1 (b) – 1 (c) undefined. (d) $\sqrt{3}$

14 **In the opposite figure :**

If the area of Δ DEF = 6 cm^2

, then the area of the shaded area = ... cm^2



(a) 27 (b) 36

(c) 48 (d) 54

---

15 The function $f : f(\mathcal{X}) = a\,\mathcal{X}^2 + b\,\mathcal{X} + c$ has one sign in $\mathbb{R}$ when .....

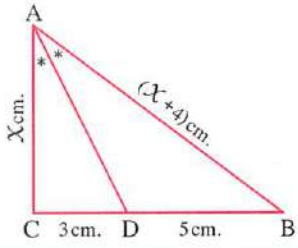
(a) $b^2 - 4\,a\,c > 0$ (b) $b^2 - 4\,a\,c < 0$

(c) $b^2 - 4\,a\,c = 0$ (d) $b^2 - 4\,a\,c \geq 0$

---

16 **In the opposite figure :**

$\mathcal{X}$ = ...



(a) 3 (b) 4

(c) 5 (d) 6

---

17 The simplest form of the expression : $\sin(180° + \theta) \times \sec(270° + \theta)$ = ...

(a) $2\sin\theta$ (b) 1 (c) -1 (d) $2\sec\theta$

---

18 If $(3\,\mathcal{X} - 5)°$ is the smallest positive measure , $(3\,y - 5)°$ is the greatest negative measure of two equivalent angles in the standerd position , then $\mathcal{X} - y$ = ...

(a) 360° (b) 180° (c) 120° (d) 90°

---

19 $\cos^{-1}\mathcal{X} + \sin^{-1}\mathcal{X}$ = ...

(a) zero (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{2}$ (d) π

---

20 If $\mathcal{X} + y\,i = (1 + i)^3$, then $\mathcal{X} + y$ = ...

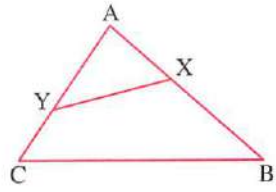
(a) 4 (b) 2 (c) zero (d) 6

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21 **In the opposite figure :**

ABC is triangle , $X \in \overline{AB}$, $Y \in \overline{AC}$

If XBCY is a cyclic quadrilateral , then .....



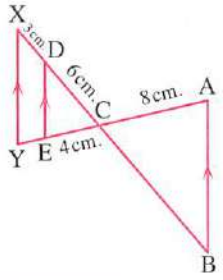
(a) $\frac{AX}{AB} = \frac{AY}{AC}$ (b) $AX \times AB = AY \times AC$

(c) $\frac{AX}{XB} = \frac{AY}{YC}$ (d) $(XY)^2 = AX \times AB$

22 **In the opposite figure :**

$\overline{AB} // \overline{DE} // \overline{XY}$, AC = 8 cm. , CE = 4 cm.

, CD = 6 cm. , DX = 3 cm. , then BC + EY = ... cm.



(a) 12 (b) 15

(c) 8 (d) 14

23 The equation that has the two roots 3 i , – 3 i is .....

(a) $x^2 + 9 = 0$ (b) $x^2 = 9$ (c) $x^2 + 3 = 0$ (d) $x^2 = 3$

24 sin (90° – θ) sec θ = ...

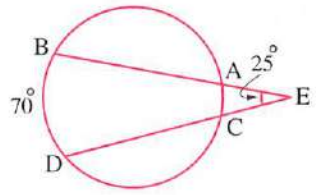
(a) 1 (b) – 1 (c) zero (d) 90°

25 If k is the scale factor of similarity between two similar polygons , then the two polygons are congruent if .....

(a) k > 1 (b) 0 < k < 1 (c) k = 1 (d) k = 0

26 **In the opposite figure :**

m $(\overset{\frown}{AC})$ = ... °



(a) 20 (b) 30

(c) 40 (d) 50

27 If M , (5 – M) are the two roots of the equation : $x^2 - k x + 6 = 0$, then k = ...

(a) – 5 (b) 5 (c) 6 (d) – 8

28 The two roots of the equation : $x + \frac{9}{x} = 6$ are .....

(a) two equal real roots. (b) two complex and non real roots.

(c) two different real roots. (d) two equal imaginary numbers.

Second Essay questions

Answer the following questions :

1 The ratio between the length of two corresponding sides of two similar polygons is 5 : 3

If the difference between their areas is 32 cm^2

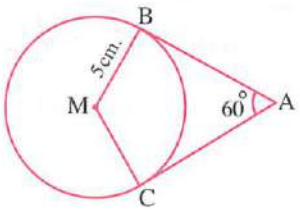
Find the area of each polygon.

2 **Solve the following inequality in $\mathbb{R}$:** $(x + 3)^2 \leq 10 - 3(x + 3)$

3 **In the opposite figure :**

$\overline{AB}$, $\overline{AC}$ are two tangent segments to the circle M at B and C , m ($\angle$ A) = 60° , MB = 5 cm.

Find the length of the minor arc $\overset{\frown}{BC}$



4 **Prove without using the calculator :**

$\sin(600°)\cos(-30°) + \sin(150°)\cos(240°) = \sin\frac{3\pi}{2}$

5 $\overline{AD}$ is a median in Δ ABC , $\overrightarrow{DX}$ bisects $\angle$ ADB and intersects $\overline{AB}$ at X , $\overrightarrow{DY}$ bisects $\angle$ ADC and intersects $\overline{AC}$ at Y , **prove that :** $\overline{XY} \parallel \overline{BC}$

Model 4

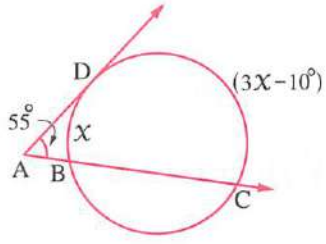
Interactive test 4

First Multiple choice questions

Choose the correct answer from the given ones :

1 **In the opposite figure :**

If $\overrightarrow{AD}$ is a tangent to the circle , m ($\angle$ A) = 55° , m $(\overset{\frown}{DC})$ = (3 $\mathcal{X}$ – 10°) , m $(\overset{\frown}{DB})$ = $\mathcal{X}$, then $\mathcal{X}$ = ...°



(a) 120 (b) 60

(c) 30 (d) 15

2 If θ is the measure of an acute angle and sin (θ + 10°) = cos (50°) , then θ = ...

(a) 30° (b) 40° (c) 20° (d) 50°

3 The ratio between the length of two radii of two circles is 3 : 5 , if the area of the smaller circle is 27 cm^2 , then the area of the greater circle equals ..... cm^2

(a) 45 (b) 50 (c) 75 (d) 100

4 If $\mathcal{X}$ = – 1 is one of the two roots of the equation : $\mathcal{X}^2$ – k $\mathcal{X}$ – 6 = 0 , then k = ...

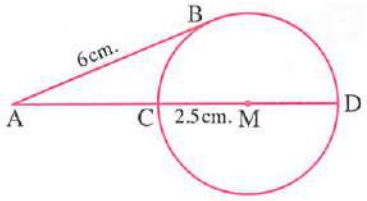
(a) 5 (b) – 5 (c) 6 (d) – 6

5 **In the opposite figure :**

$\overline{AB}$ is a tangent segment to circle M ,

AB = 6 cm. , CM = 2.5 cm.

, then AC = ... cm.



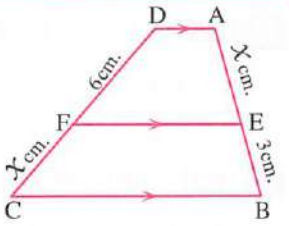
(a) 9 (b) 4 (c) 2.5 (d) 5

6 **In the opposite figure :**

χ = ...

(a) 6 (b) $3\sqrt{2}$

(c) $3\sqrt{3}$ (d) 18

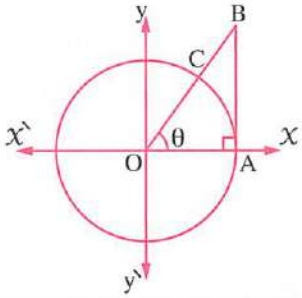


7 **In the opposite figure :**

$\overline{AB}$ is a tangent segment of a unit circle , then OB = ...

(a) sin θ (b) cos θ

(c) csc θ (d) sec θ



8 The function $f : f(\chi) = 3 - \chi$ is non-negative at $\chi \in$ .....

(a) $]-\infty , 3[$ (b) $]-\infty , 3]$ (c) $[3 , \infty[$ (d) $]3 , \infty[$

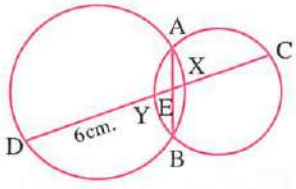
9 The degree measure of an inscribed angle opposite an arc whose length 5 π cm. in a circle with radius 15 cm. equals .....

(a) 120° (b) 60° (c) 30° (d) 90°

10 **In the opposite figure :**

If DY = 6 cm. and $\frac{XE}{EY} = \frac{2}{3}$

, then CX = ... cm.



(a) 2 (b) 3

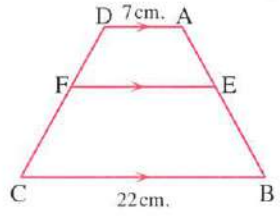
(c) 4 (d) 5

11 If the function $f : f(\chi) = a \cos b\chi$ where $a > 0$ is a periodic function and its period $\frac{\pi}{2}$ and its range $[-1 , 1]$, then $\left|\frac{a}{b}\right|$ = ...

(a) $\frac{1}{2}$ (b) 1 (c) $\frac{1}{8}$ (d) $\frac{1}{4}$

12 **In the opposite figure :**

$\frac{AE}{EB} = \frac{2}{3}$, then FE = ... cm.



(a) 9 (b) 11

(c) 13 (d) 15

13 If $\Delta ABC \sim \Delta DEF$, $m(\angle A) = 50°$, $m(\angle E) = 60°$, then $m(\angle C)$ = ...

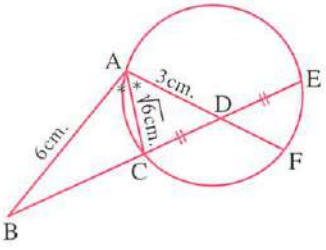
(a) 110° (b) 70° (c) 100° (d) 120°

14 **In the opposite figure :**

$\overrightarrow{AC}$ bisects $\angle BAD$, D is the midpoint of $\overline{EC}$

, $AC = \sqrt{6}$ cm. , AD = 3 cm.

, AB = 6 cm. , then DF = ... cm.



(a) 2 (b) 3

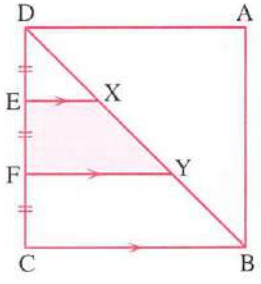
(c) 3.5 (d) 4

15 **In the opposite figure :**

ABCD is a square of side length 6 cm.

, DE = EF = FC

, then the area of (polygon XYFE) = ... cm^2



(a) 6 (b) 8

(c) 10 (d) 12

16 If L , M are the two roots of the quadratic equation $x^2 + 1 = 0$

, then $L^{2018} + M^{2018}$ = ...

(a) $-2i$ (b) $2i$ (c) -2 (d) 2

17 If one of the two roots of the equation $(x + k)^2 - 6x = 0$ is additive inverse of the other

, then k = ...

(a) 6 (b) -6 (c) 3 (d) 9

18 If the solution set of the inequality : $x^2 - 10 < bx$ is $]-2, 5[$, then b = ...

(a) -10 (b) -2 (c) 3 (d) 5

19 The quadratic equation whose roots are : $\frac{3}{i}$, $\frac{3+3i}{1-i}$ is .....

(a) $x^2 - 3x + 9 = 0$ (b) $x^2 + 9 = 0$

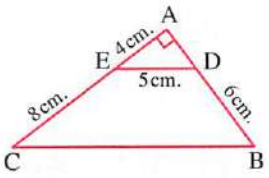
(c) $x^2 + 9x + 9 = 0$ (d) $x^2 = 9$

20 ABC is a triangle in which AB = 8 cm. , AC = 6 cm. , BC = 7 cm. Draw $\overrightarrow{AD}$ bisects $\angle BAC$, $\overrightarrow{AD} \cap \overline{BC} = \{D\}$, then BD = ... cm.

(a) 3 (b) 6 (c) 4 (d) $\sqrt{17}$

21 In the opposite figure :

$\frac{DE}{BC}$ = ...



(a) $\frac{1}{2}$ (b) $\frac{3}{4}$

(c) $\frac{1}{3}$ (d) $\frac{2}{3}$

22 If one of the roots of the equation : $3x^2 - (k+2)x + k^2 + 2k = 0$ is the multiplicative inverse of the other , then k = ...

(a) – 3 or 1 (b) – 3 or – 1 (c) 3 or – 1 (d) 3 or 1

23 If 10 sin x = 6 where x is the greatest positive angle , $x \in [0 , 2\pi[$, then the numerical value of the expression : sec (540° + x) equals .....

(a) $\frac{3}{5}$ (b) $\frac{-5}{4}$ (c) $\frac{5}{4}$ (d) $\frac{-5}{3}$

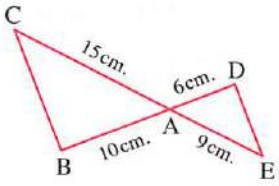
24 In the opposite figure :

$\overline{DB} \cap \overline{EC} = \{A\}$

, AE = 9 cm. , AB = 10 cm. , AC = 15 cm.

, DA = 6 cm. , a (Δ ADE) = 36 cm^2

, then a (Δ ABC) = ... cm^2

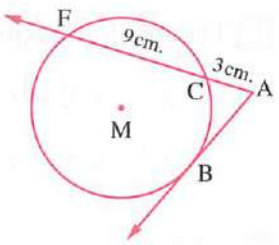


(a) 60 (b) 75 (c) 100 (d) 225

25 The range of the function f : $f(x) = 4 \sin x$ where $x \in [0 , \pi]$ equals .....

(a) $[0 , 4]$ (b) $[0 , 4[$ (c) $[-4 , 0]$ (d) $[-4 , 4]$

26 **In the opposite figure :**



$\overrightarrow{AB}$ touches the circle M at B , $\overrightarrow{AF}$ intersects the circle M at the two points C , F respectively. If AC = 3 cm. , CF = 9 cm. , then $P_M(A)$ = ...

(a) 6 (b) 9 (c) 27 (d) 36

27 If the two roots of the equation : $x^2 - 4x + k = 0$ are real , then k ∈ .....

(a) $[4 , \infty[$ (b) $]-\infty , 4[$ (c) $]4 , \infty[$ (d) $]-\infty , 4]$

28 If $3x - 2yi = (5 - 2i)^2$, then $y - x$ = ...

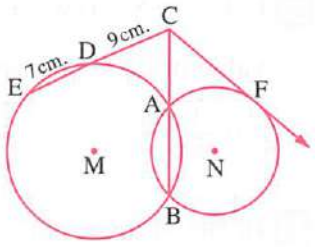
(a) 17 (b) – 3 (c) 3 (d) $21 - 20i$

Second Essay questions

Answer the following questions :

1 Investigate in ℝ the sign of the function $f : f(x) = 8 + 2x - x^2$ showing that on number line , then find in ℝ the solution set of the inequality : $8 + 2x - x^2 \geq 0$

2 **In the opposite figure :**



M and N are two intersecting circles at A and B , $C \in \overrightarrow{BA}$, $C \notin \overline{BA}$ Draw $\overrightarrow{CD}$ to intersect circle M at D , E where CD = 9 cm. , DE = 7 cm.

Draw $\overrightarrow{CF}$ to touch circle N at F

[1] Prove that : $P_M(C) = P_N(C)$

[2] If : AB = 10 cm. , find the length of each $\overline{AC}$, $\overline{CF}$

3 In Δ ABC , AB = 8 cm. , AC = 4 cm. , $D \in \overrightarrow{AC}$, $D \notin \overline{AC}$ where CD = 12 cm.

Prove that : $\overline{AB}$ touches the circle passes through the points B , C , D

4 If Δ ABC is right-angled triangle at angle C , sin A + cos B = 1

Find the value of sin 5 A

5 ABC is a triangle , $D \in \overline{AB}$ where AD = 2 BD , $E \in \overline{AC}$ where $\overline{DE} // \overline{BC}$

If the area of Δ ADE = 60 cm^2 , find the area of the trapezium DBCE

Model 5

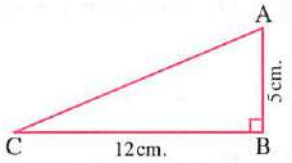
Interactive test 5

First Multiple choice questions

Choose the correct answer from the given ones :

1 **In the opposite figure :**

$\sin\left(\tan^{-1}\left(\frac{5}{12}\right)\right) =$ .....



(a) $\frac{5}{12}$ (b) $\frac{5}{13}$

(c) $\frac{12}{13}$ (d) 13

2 If L , M are the two roots of the equation : $\mathcal{X}^2 + 3\,\mathcal{X} - 4 = 0$, then LM = ...

(a) 3 (b) -3 (c) 4 (d) -4

3 The solution set of the equation : $\mathcal{X}^2 + 9 = 0$ in $\mathbb{R}$ is .....

(a) $\{-3\}$ (b) $\{3\}$ (c) $\{-3\ ,3\}$ (d) $\varnothing$

4 If S_1 is the solution set of the inequality : $\mathcal{X}^2 - \mathcal{X} - 2 \leq 0$ in $\mathbb{R}$ and S_2 is the solution set of the inequality : $\mathcal{X}^2 + \mathcal{X} - 2 \leq 0$ in $\mathbb{R}$, then $S_1 \cap S_2$ = ...

(a) $\varnothing$ (b) $[-2\ ,2]$

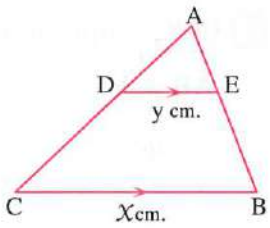
(c) $[-1\ ,1]$ (d) $\mathbb{R} -]-1\ ,1[$

5 **In the opposite figure :**

If $\overline{DE} \,//\, \overline{BC}$, DE = y cm.

, BC = $\mathcal{X}$ cm. and $2\,\mathcal{X}^2 - 3\,\mathcal{X}\,y - 5\,y^2 = 0$

, AB = 10 cm. , then EB = ... cm.



(a) 3 (b) 4 (c) 6 (d) 8

6 The angle with measure 585° in standard position is equivalent to the angle with measure .....

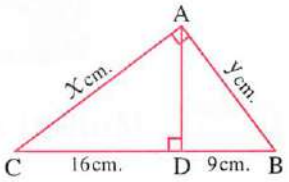
(a) $\frac{1}{4}\,\pi$ (b) $\frac{5}{4}\,\pi$ (c) $\frac{3}{4}\,\pi$ (d) $\frac{7}{4}\,\pi$

7 If $\Delta ABC \sim \Delta XYZ$ and AB = 3 XY , then $\frac{a(\Delta XYZ)}{a(\Delta ABC)}$ = ...

(a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{4}{1}$ (d) $\frac{9}{1}$

8 **In the opposite figure :**

$\frac{y}{x}$ = ...



(a) 1 (b) $\frac{4}{3}$

(c) $\frac{3}{4}$ (d) 2

9 The function $y = \sin\left(\frac{\pi}{4} + x\right)$ has maximum value at x = ...

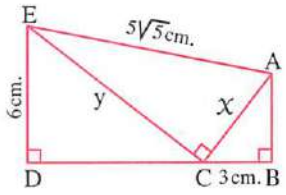
(a) $\frac{\pi}{2}$ (b) $\frac{-\pi}{2}$ (c) $\frac{\pi}{4}$ (d) zero

10 The sign of $f : f(x) = -5x$ is negative at .....

(a) $x > -5$ (b) $x < -5$ (c) $x > 0$ (d) $x < 0$

11 **In the opposite figure :**

$x + y$ = ... cm.



(a) 12 (b) 15

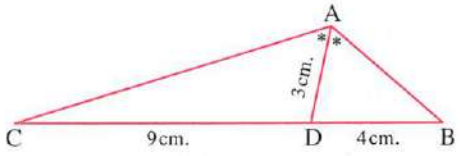
(c) 18 (d) 21

12 If $\overrightarrow{AB}$ is a tangent to a circle at B , $\overrightarrow{AC}$ intersects the circle at C , D where $C \in \overline{AD}$, AC = 3 cm. AB = 6 cm. , then CD = ... cm.

(a) 6 (b) 9 (c) 12 (d) 15

13 **In the opposite figure :**

$AB \times AC$ = ... cm^2



(a) 36 (b) 45

(c) 12 (d) 27

14 In circle M , if two chords $\overline{AB}$ and $\overline{CF}$ intersecting at D , then .....

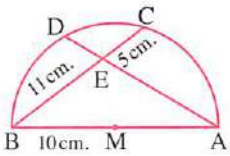
(a) $P_M(D) = (AB)^2 - r^2$ (b) $AD \times DB = AM \times MB$

(c) $P_M(D) + AD \times DB$ = zero (d) $P_M(D) = CD \times DF$

15 If $\tan(4\theta) = \cot(5\theta)$, then $\sin(3\theta)$ = ... where 3θ is the measure of an acute angle.

(a) $\frac{1}{2}$ (b) 1 (c) -1 (d) $\frac{\sqrt{3}}{2}$

16 **In the opposite figure :**



The radius length of semicircle (M) = 10 cm.

, then ED = ... cm.

(a) $\frac{50}{13}$ (b) $\frac{55}{13}$

(c) $\frac{57}{13}$ (d) $\frac{59}{13}$

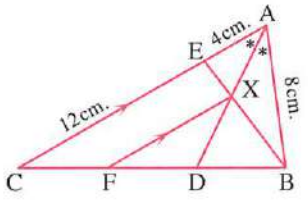
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17 If the two roots of the equation : $a x^2 + b x + c = 0$ are equal in value but different in signs , then .....

(a) $c = 0$ (b) $a = 0$ (c) $b = 0$ (d) otherwise.

---

18 **In the opposite figure :**



$\frac{DF}{BC}$ = ...

(a) $\frac{4}{3}$ (b) $\frac{2}{3}$

(c) $\frac{3}{5}$ (d) $\frac{1}{3}$

---

19 If the distance between point A from the centre of a circle equals 24 cm. and the power of this point with respect to this circle equals 176 , then the radius length of this circle equals ..... cm.

(a) $4\sqrt{47}$ (b) 400 (c) 20 (d) 38

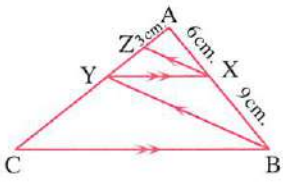
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20 The length of an arc opposite to a central angle of measure 150° in a circle with radius length 8 cm. equals ..... cm.

(a) $\frac{20}{3}\pi$ (b) $\frac{17}{2}\pi$ (c) 8π (d) 20

---

21 **In the opposite figure :**



$\overline{XY} \parallel \overline{BC}$, $\overline{XZ} \parallel \overline{BY}$

, AX = 6 cm. , XB = 9 cm. , AZ = 3 cm.

, then the length of $\overline{ZC}$ = ... cm.

(a) 4.5 (b) $15\frac{3}{4}$ (c) 15 (d) $12\frac{3}{4}$

---

22 If $\sin 2\theta = \cos\theta$, then θ could be equal .....°

(a) 18 (b) 30 (c) 36 (d) 45

23 If (2 i) is a root of the quadratic equation : $x^2 + a\,x + b = 0$ where the coefficients of its terms are real numbers , then all the following are true except .....

(a) the other root of the quadratic equation is (– 2 i)

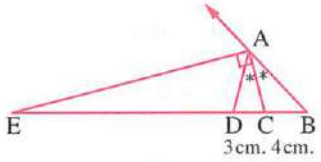
(b) the sum of the roots = zero

(c) the product of the roots = – 4

(d) the discriminant of the quadratic equation < zero

24 **In the opposite figure :**

$\overrightarrow{AC}$ bisects $\angle A$ of triangle ABD internally , $\overline{AE} \perp \overline{AC}$, BC = 4 cm. , CD = 3 cm. , then BE : ED = ...



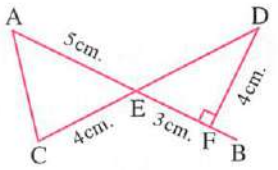
(a) 7 : 4 (b) 7 : 3 (c) 3 : 4 (d) 4 : 3

25 If $f(x) = x + 2$, where $x \in]-4 , 3[$, then $f(x)$ is positive at $x \in$ .....

(a) $]-\infty , -2[$ (b) $]-2 , \infty[$ (c) $]-4 , -2[$ (d) $]-2 , 3[$

26 **In the opposite figure :**

If $\overline{AB} \cap \overline{DC} = \{E\}$, AE = 5 cm. , EF = 3 cm. , EC = 4 cm. , DF = 4 cm. , $\overline{DF} \perp \overline{BE}$, the points A , B , C , D lie on a circle , then the length of $\overline{FB}$ = ... cm.



(a) 0.5 (b) 1 (c) 1.5 (d) 2

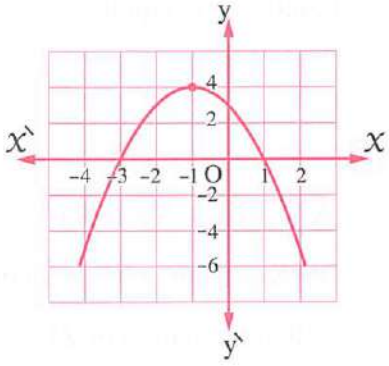
27 If the opposite figure represents a graph of a quadratic function in one variable , then the rule of the function can be written as .....

(a) $f(x) = -x^2 - 2x + 3$

(b) $f(x) = -x^2 + 2x + 3$

(c) $f(x) = x^2 + 2x + 3$

(d) $f(x) = -x^2 + 2x - 3$



28 If the roots of the equation : $k\,x^2 - 8\,x + 16 = 0$ are two complex and non real , then .....

(a) k > 2 (b) k < 2 (c) $k \in]1 , 10[$ (d) k > 1

Second Essay questions

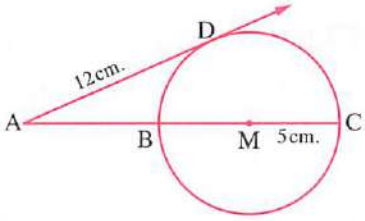
Answer the following questions :

1 **In the opposite figure :**

The radius of circle M is 5 cm.

, $\overrightarrow{AD}$ is a tangent at D , AD = 12 cm.

Find the length of $\overline{AC}$



2 If $\sin\theta = \frac{4}{5}$ where $90° < \theta < 180°$ **Find the value of :**

$\sin(180° - \theta) + \tan(360° - \theta) + 2\sin(270° - \theta)$

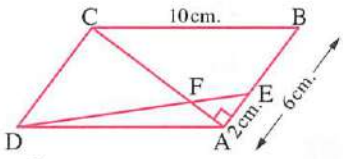
3 If $\mathcal{X} = \frac{13 + 13i}{5 + i}$, $y = \frac{5 + i}{1 + i}$, **find :** $\mathcal{X} + y$

4 **In the opposite figure :**

ABCD is a parallelogram in which AB = 6 cm. , BC = 10 cm.

, m (∠ BAC) = 90° , E ∈ $\overline{AB}$ such that : AE = 2 cm.

, $\overline{DE}$ intersects $\overline{AC}$ at F **Prove that :** Δ AFE is an isosceles triangle.

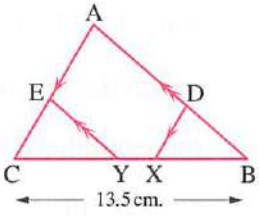


5 **In the opposite figure :**

ABC is a triangle in which : $\overline{DX} // \overline{AC}$, $\overline{EY} // \overline{AB}$,

BC = 13.5 cm. , $\frac{AD}{DB} = \frac{3}{2}$, $EC = \frac{4}{5}$ AE

Find the length of : $\overline{XY}$



Model 6

Interactive test 6

First Multiple choice questions

Choose the correct answer from the given ones :

1 If the two roots of the equation : $4\mathcal{X}^2 - 12\mathcal{X} + c = 0$ are real and equal , then c = ...

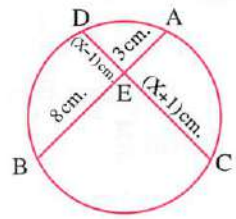
(a) 3 (b) 4 (c) 9 (d) 16

2 **In the opposite figure :**

$\mathcal{X}$ = ...

(a) 25 (b) 24

(c) 5 (d) 8



3 The solution set of the equation : $(x + 1)^2 = \text{zero}$ in $\mathbb{R}$ is .....

(a) $\{-1\}$ (b) $\{1\}$ (c) $\{-1, 1\}$ (d) $\varnothing$

4 If $b^2 - 4ac < 0$ in the equation $ax^2 + bx + c = 0$, then the solution set of the inequality $ax^2 + bx + c < 0$ where a is negative is .....

(a) $\mathbb{R}$ (b) $\varnothing$ (c) $\mathbb{R}^+$ (d) $\mathbb{R}^-$

5 All ..... are similar.

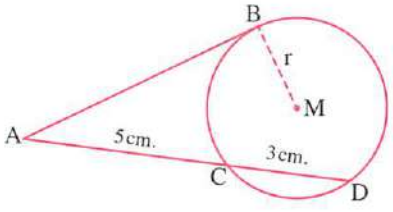
(a) triangles (b) rectangles (c) parallelograms (d) squares

6 **In the opposite figure :**

$P_M(A)$ = ...

(a) 25 (b) $(AB)^2 - r^2$

(c) 40 (d) $(AM)^2 - (AB)^2$



7 **In the opposite figure :**

A pendulum swings through an angle of measure 60°

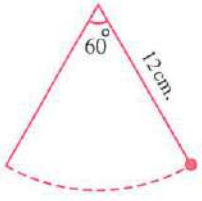
if the length of its string is 12 cm.

, then the length of the circular path covered by

the pendulum equals .....

(a) 3π cm. (b) 4π cm.

(c) 6π cm. (d) 8π cm.

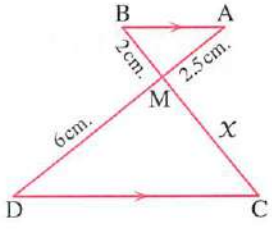


8 **In the opposite figure :**

x = ... cm.

(a) 3.6 (b) 4

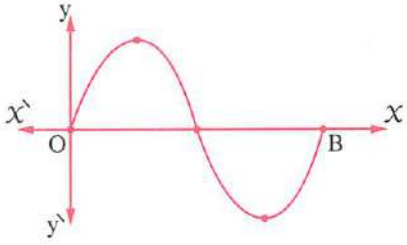
(c) 4.2 (d) 4.8



9 The opposite figure represents the curve $y = 3 \sin \frac{1}{2} x$, then the x coordinates of the point B is .....

(a) $\frac{\pi}{2}$ (b) π

(c) 2π (d) 4π



10 $\sec(\cos^{-1} \text{zero}) =$ .....

(a) 1 (b) – 1 (c) undefind. (d) zero

11 The angle with measure (– 120°) lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

12 **In the opposite figure :**

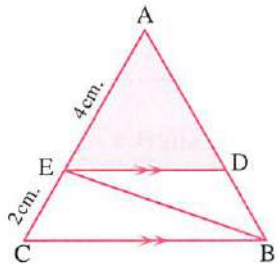
If $\overline{DE} \,//\, \overline{BC}$

and the area of (Δ EBC) = 9 cm^2

, then the area of (Δ ADE) = ... cm^2

(a) 6 (b) 12

(c) 18 (d) 27



13 **In the opposite figure :**

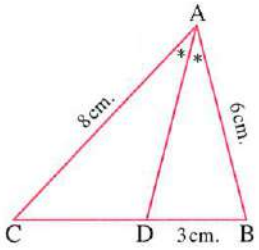
$\overrightarrow{AD}$ bisects $\angle$ BAC , AB = 6 cm.

, AC = 8 cm. , BD = 3 cm.

, then AD = ... cm.

(a) 4 (b) 5

(c) 6 (d) 8

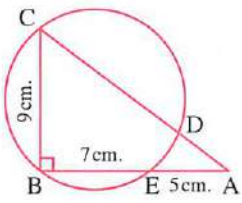


14 **In the opposite figure :**

DC = ... cm.

(a) 9 (b) 10

(c) 11 (d) 12



15 If a , b and c are integers , a + b + c = 0 , a $\neq$ c , then the roots of the equation :

$(b + c - a)\,x^2 + (c + a - b)\,x + (a + b - c) = 0$ are .....

(a) real and equal. (b) distinct rational real.

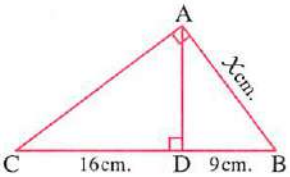
(c) distinct irrational real. (d) not real.

16 **In the opposite figure :**

x = ...

(a) 9 (b) 12

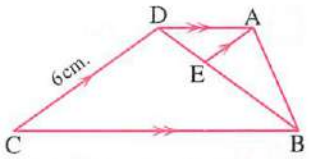
(c) 20 (d) 15



17 **In the opposite figure :**

If BE = 2 ED

, then AE = ... cm.



(a) 1 (b) 2 (c) 3 (d) 4

18 The sign of function $f : f(X) = 7 - X$ is negative in the interval .....

(a) $]-\infty , 7[$ (b) $]-\infty , \infty[$ (c) $]7 , \infty[$ (d) $]-7 , 7[$

19 If $\sin\theta = -\frac{1}{2}$, $\cos\theta = \frac{\sqrt{3}}{2}$, then θ = ...

(a) 30° (b) 150° (c) 210° (d) 330°

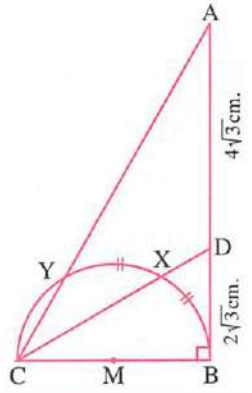
20 **In the opposite figure :**

If m $(\overset{\frown}{BX})$ = m $(\overset{\frown}{XY})$

and $\overrightarrow{BA}$ is a tangent to the circle M at B

, BD = $2\sqrt{3}$ cm. , AD = $4\sqrt{3}$ cm.

, then AY = ... cm.



(a) $4\sqrt{3}$ (b) 6

(c) 9 (d) 12

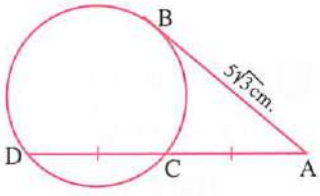
21 If (2 + 3 i) + (1 − i) = X + y i , then X + y = ...

(a) 2 (b) − 4 (c) 5 (d) 7

22 **In the opposite figure :**

$\overline{AB}$ is a tangent segment , C is the midpoint of $\overline{AD}$

, AB = $5\sqrt{3}$ cm. , then CD = ... cm.

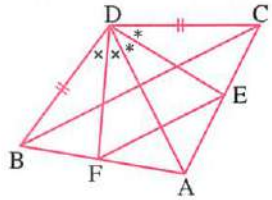


(a) $2\sqrt{6}$ (b) $5\sqrt{6}$

(c) 5 (d) $2.5\sqrt{6}$

23 **In the opposite figure :**

$\frac{CD}{DA}$ = ...



(a) $\frac{AE}{EC}$ (b) $\frac{DE}{DF}$

(c) $\frac{AC}{AB}$ (d) $\frac{BF}{FA}$

24 If $f(x) = x^2 - 7x + 12$, $x \in \mathbb{R}$, then all the following are true except .....

(a) the solution set of the equation $f(x) = 0$ is $\{3 , 4\}$

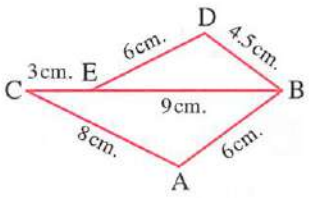
(b) the solution set of the inequality $f(x) > 0$ is $\mathbb{R} - [3 , 4]$

(c) the solution set of the inequality $f(x) < 0$ is $]3 , 4[$

(d) $f(x)$ is positive in the interval $\mathbb{R} -]3 , 4[$

25 In the opposite figure :

B , E and C are collinear. If CE = 3 cm. , BE = 9 cm. , BD = 4.5 cm. , DE = 6 cm. , BA = 6 cm. , AC = 8 cm. , then the scale factor of the similarity of the two triangles ABC , DBE = ...



(a) 4 : 3 (b) 3 : 4 (c) 16 : 9 (d) 9 : 16

26 If $\tan(180° + 5\theta) + \tan(270° + 4\theta) = 0$, then the value of θ which satisfies the equation , where $\theta \in]0 , \frac{\pi}{2}[$ from the following equals .....°

(a) 5 (b) 10 (c) 20 (d) 90

27 The quadratic equation in which each of its two roots more than the two roots of the equation : $x^2 - 3x + 2 = 0$ by 2 is .....

(a) $x^2 - 3x + 2 = 0$ (b) $x^2 + 7x + 12 = 0$

(c) $x^2 - 7x + 12 = 0$ (d) $x^2 - 7x - 12 = 0$

28 If L is one of the roots of the equation : $x^2 + 4x + 7 = 0$, then $(L + 2)^2 =$ .....

(a) – 11 (b) 11 (c) 3 (d) – 3

Second Essay questions

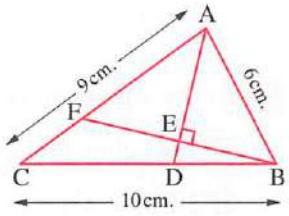
Answer the following questions :

1 Find the values of θ where $0° \leq \theta \leq 90°$ which satisfies :

$\tan(\theta + 20)° = \cot(3\theta + 30°)$

2 In the opposite figure :

ABC is a triangle in which AB = 6 cm. , AC = 9 cm. and BC = 10 cm. , D $\in \overline{BC}$ where BD = 4 cm. , $\overrightarrow{BE} \perp \overline{AD}$ and intersects $\overline{AD}$ and $\overline{AC}$ at E and F respectively.



[1] Prove that : $\overrightarrow{AD}$ bisects $\angle A$

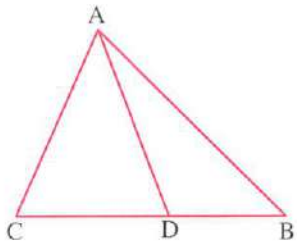
[2] Find : Area of ΔABF : Area of ΔCBF

3 If the terminal side of angle θ in the standard position intersects the unit cricle at point $\left(\frac{\sqrt{5}}{3}, \frac{-2}{3}\right)$ **Find the value of :** $\sin\left(\frac{\pi}{2} - \theta\right) + \cot(2\pi - \theta)$

4 **In the opposite figure :**

If $(AC)^2 = CD \times CB$

Prove that : $\Delta ACD \sim \Delta BCA$



4 **In the opposite figure :**

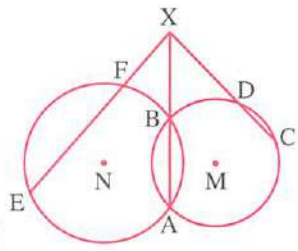
The two circles M and N are intersecting at A and B where $\overrightarrow{AB} \cap \overrightarrow{CD} \cap \overrightarrow{EF} = \{X\}$,

$XD = 2\ DC$, $EF = 10$ cm. and $P_N(X) = 144$

[1] Prove that : $\overleftrightarrow{AB}$ is the principle axis to the two circles M and N

[2] Find the length of each of : $\overline{XC}$ and $\overline{XF}$

[3] Prove that : CDFE is a cyclic quadrilateral.



Model 7

Interactive test 7

First Multiple choice questions

Choose the correct answer from the given ones :

1 If the sum of the measures of interior angles in any convex polygon = $180°(n - 2)$ where n is the number of sides , then the measure of an interior angle in a regular hexagon in radian = ...

(a) $\frac{\pi}{3}$ (b) $\frac{3\pi}{4}$ (c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{2}$

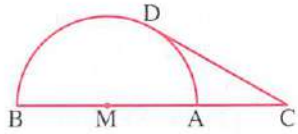
2 The angle with measure $\frac{31\pi}{6}$ lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

3 **In the opposite figure :**

$\overline{CD}$ touches the semicircle M at D

If $2\ CA = AB = 6$ cm. , then CD = ... cm.

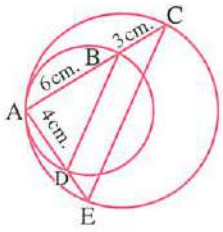


(a) 6 (b) 3 (c) $3\sqrt{3}$ (d) 27

4 **In the opposite figure :**

Two circles touching internally at A

, then ED = ... cm.



(a) 2 (b) 3

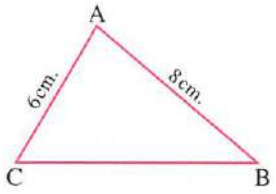
(c) 3.5 (d) 4

5 If $2\cos\theta = -\sqrt{3}$, $\pi < \theta < \frac{3\pi}{2}$, then θ = ...

(a) $\frac{\pi}{3}$ (b) $\frac{6\pi}{7}$ (c) $\frac{4\pi}{3}$ (d) $\frac{7\pi}{6}$

6 **In the opposite figure :**

If m ($\angle$ A) = 2 m ($\angle$ B) , then BC = ... cm.

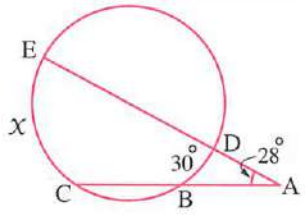


(a) $3\sqrt{10}$ (b) $2\sqrt{21}$

(c) 12 (d) 10

7 **In the opposite figure :**

χ = ...



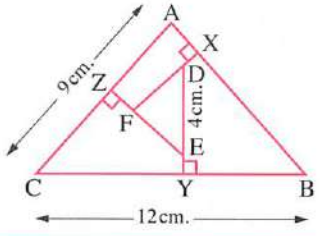
(a) 30° (b) 60°

(c) 86° (d) 26°

8 **In the opposite figure :**

If $\overline{FX} \perp \overline{AB}$, $\overline{DY} \perp \overline{BC}$, $\overline{EZ} \perp \overline{AC}$, AC = 9 cm.

, BC = 12 cm. , DE = 4 cm. , then EF = ... cm.



(a) 2 (b) 3

(c) 5 (d) 6

9 Which of the following is a factorization to the expression : $\chi^2 + 4$?

(a) $(\chi - 2)(\chi + 2)$ (b) $(\chi + 2)^2$

(c) $(\chi - 2\,i)^2$ (d) $(\chi - 2\,i)(\chi + 2\,i)$

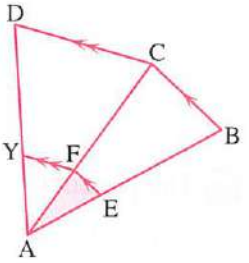
10 **In the opposite figure :**

If the area of (polygon DYFC) = 40 cm^2

, the area of (polygon FEBC) = 32 cm^2

, the area of (Δ AFY) = 5 cm^2

, then the area of (Δ AEF) = ... cm^2

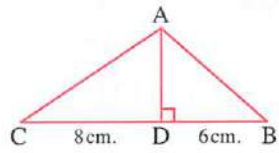


(a) 3 (b) 4

(c) 5 (d) 6

11 **In the opposite figure :**

AB cos B + AC cos C = ... cm.



(a) 6 (b) 8

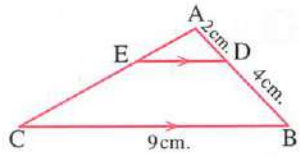
(c) 14 (d) 48

12 **In the opposite figure :**

If the area of Δ ADE = 8 cm^2

, then the area of the figure

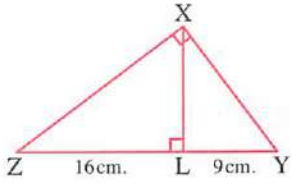
DBCE = ... cm^2



(a) 27 (b) 64 (c) 24 (d) 16

13 **In the opposite figure :**

XL = ... cm.



(a) 7 (b) 12

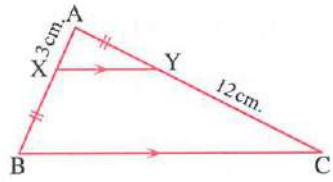
(c) 20 (d) 144

14 The function $f : f(\mathcal{X}) = 2\mathcal{X}$ is positive in .....

(a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\mathbb{R}^-$ (d) $\mathbb{R} - \{0\}$

15 **In the opposite figure :**

AC = ... cm.



(a) 15 (b) 16

(c) 18 (d) 20

16 The opposite figure show the curve

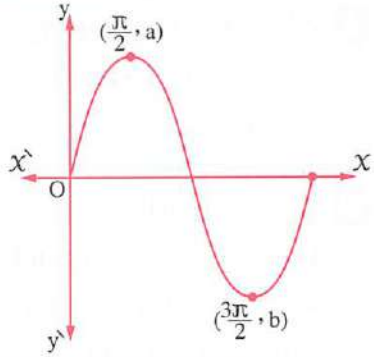
$y = \sin \mathcal{X}$, then $|a| + |b|$ = ...

(a) 1

(b) 2

(c) π

(d) 2π



17 The product of the roots of the equations :

$a\mathcal{X}^2 + b\mathcal{X} + c = 0$, $b\mathcal{X}^2 + c\mathcal{X} + a = 0$, $c\mathcal{X}^2 + a\mathcal{X} + b = 0$ equals .....

(a) ABC (b) – 1 (c) 1 (d) zero

18 If $x + y\,i = i^{15} + 2\sqrt{-4}$, then $x + y =$ .....

(a) 3 (b) 4 (c) zero (d) – 3

19 If the two roots of the equation : $x^2 + 4x + k = 0$ are distinct real , then $k \in$ .....

(a) $]-\infty , 4[$ (b) $]4 , \infty[$ (c) $]-\infty , 4]$ (d) $\{4\}$

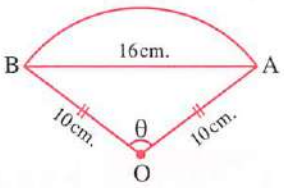
20 If AM = 12 cm. , r = 9 cm. , where A is point outside circle M , then $P_M(A)$ = ...

(a) 65 (b) 63 (c) 49 (d) 7

21 **In the opposite figure :**

$\overset{\frown}{AB}$ is an arc in a circle whose centre O

, then find the length of $\overset{\frown}{AB} \simeq$ ..... cm.

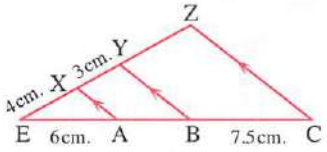


(a) 19 (b) 25

(c) 18 (d) 21

22 **In the opposite figure :**

AB + YZ = ... cm.



(a) 5 (b) 13

(c) 11 (d) 9.5

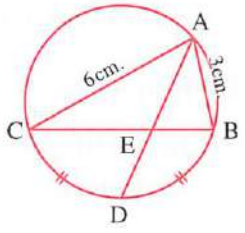
23 $(x + 2i)(x - 2i)$ = ...

(a) $x^2 + 4$ (b) $x^2 - 4$

(c) $4xi - 4$ (d) $x^2 - 4xi + 4$

24 **In the opposite figure :**

$\frac{BE}{BC}$ = ...



(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) 2 (d) 3

25 The solution set of the equation : $x^2 + 1 = 0$ in $\mathbb{R}$ is .....

(a) $\{1\}$ (b) $\{1 , -1\}$ (c) $\varnothing$ (d) $\{-i , i\}$

26 If the ratio between the areas of two similar polygons is 16 : 25 , then the ratio between their two corresponding sides = ...

(a) 2 : 5 (b) 4 : 5 (c) 16 : 25 (d) 16 : 41

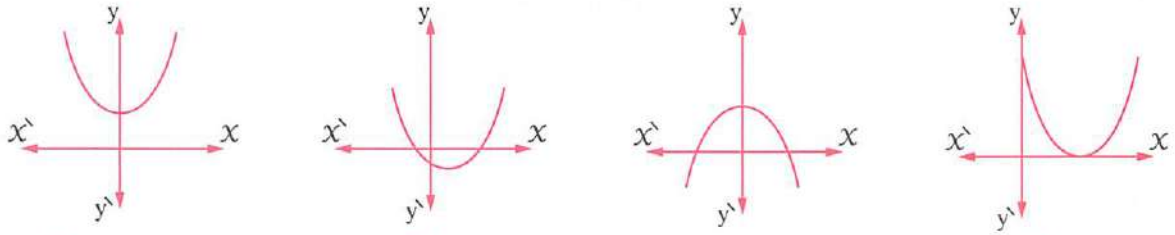
27 The quadratic equation whose roots are : $2-\sqrt{3}$, $2+\sqrt{3}$ is .....

(a) $x^2+2x+3=0$ (b) $x^2-4x+1=0$

(c) $x^2-4x+7=0$ (d) $x^2+4x+1=0$

28 Each of the following figures represents the curve of the function f :

$f(x)=a\,x^2+b\,x+c$ which of these figures does have $b^2-4\,a\,c=0$



(a) (b) (c) (d)

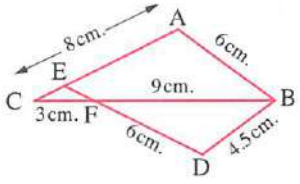
Second Essay questions

Answer the following questions :

1 **In the opposite figure :**

$\overline{BC} \cap \overline{DE} = \{F\}$, AB = 6 cm. , BC = 12 cm. , AC = 8 cm. , FC = 3 cm. , BD = 4.5 cm. , DF = 6 cm. **Prove that :**

[1] $\Delta ABC \sim \Delta DBF$ **[2]** ΔEFC is isosceles.



2 If $\sin\theta = \sin 750° \cos 300° + \sin(-60°) \cot 120°$ where $0° < \theta < 360°$

Find : θ

3 Determine the sign of the function f : $f(x)=x^2-x+12$ and hence determine in $\mathbb{R}$ the solution set of the inequality : $x^2+12>x$, represent the solution on the number line.

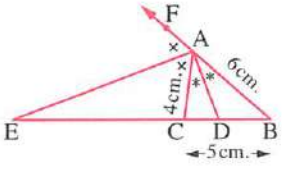
4 **In the opposite figure :**

In ΔABC : AB = 6 cm. , AC = 4 cm. , BC = 5 cm.

, $\overrightarrow{AD}$ bisects $\angle BAC$ and intersects $\overline{BC}$ at D

, $\overrightarrow{AE}$ bisects $\angle A$ externally and intersects $\overleftrightarrow{BC}$ at E

Calculate : The length of $\overline{DE}$

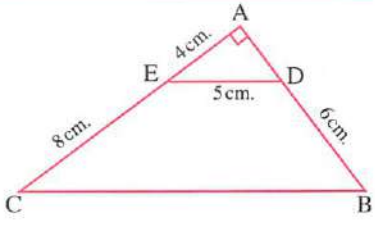


5 **In the opposite figure :**

ABC is a right-angled triangle at A

[1] Prove that : $\overline{DE} \parallel \overline{BC}$

[2] Find the length of : $\overline{BC}$



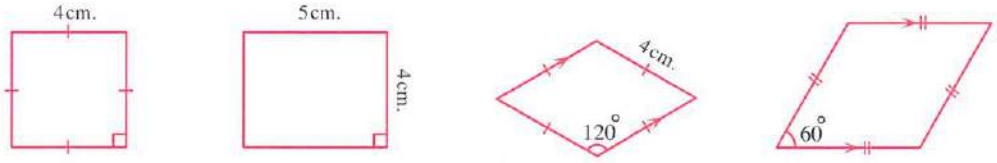
Model 8

Interactive test 8

First Multiple choice questions

Choose the correct answer from the given ones :

1 Which of the following polygons are similar ?



[1] [2] [3] [4]

(a) The two polygons [1] , [2]
(b) The two polygons [1] , [3]
(c) The two polygons [3] , [4]
(d) The two polygons [2] , [4]

2 If the terminal side of a positive angle $(90° - \theta)$ in standard position intersects the unit circle at point $\left(\frac{-3}{5} , \frac{4}{5}\right)$, then $\sin(90° - \theta) =$ .....

(a) $\frac{-3}{5}$ (b) $\frac{3}{5}$ (c) $\frac{-4}{5}$ (d) $\frac{4}{5}$

3 The function $f : f(x) = 4 - 2x$ is non-positive if .....

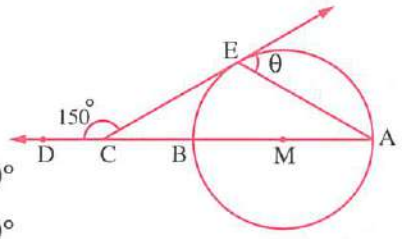
(a) $x > 2$ (b) $x < 2$ (c) $x \geq 2$ (d) $x \leq 2$

4 The measure of the central angle subtends an arc of length π cm. in a circle with diameter length 8 cm. equals .....

(a) $\frac{\pi}{8}$ (b) $\frac{\pi}{4}$ (c) $\frac{2\pi}{3}$ (d) 2π

5 **In the opposite figure :**

If $\overrightarrow{CE}$ is a tangent to the circle , then $\theta =$ .....



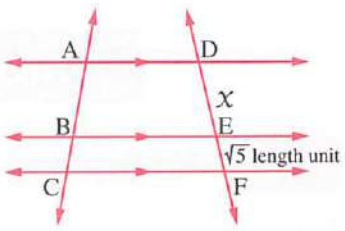
(a) 45° (b) 50°
(c) 55° (d) 60°

6 The quadratic equation whose terms coefficients are real numbers and one of its roots is $(3 - i)$ is .....

(a) $x^2 - 6x - 10 = 0$ (b) $2x^2 + 6x + 10 = 0$
(c) $x^2 - 6x + 10 = 0$ (d) $x^2 + 6x + 10 = 0$

7 **In the opposite figure :**

If A (0 , 6) , B (– 2 , 2) and C (– 3 , 0) , $\overleftrightarrow{AD} // \overleftrightarrow{BE} // \overleftrightarrow{CF}$, EF = $\sqrt{5}$ length unit , then $\mathcal{X}$ = ... length unit.



(a) $\sqrt{5}$ (b) $2\sqrt{5}$

(c) $3\sqrt{5}$ (d) $4\sqrt{5}$

8 If $\cos\theta = \frac{3}{5}$, $0° < \theta < 90°$, then $\sin(90° - \theta)$ = ...

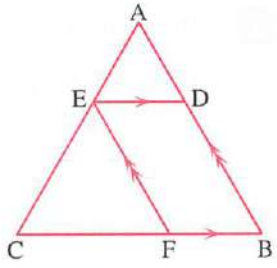
(a) $\frac{3}{4}$ (b) $\frac{5}{3}$ (c) $\frac{3}{5}$ (d) $\frac{4}{5}$

9 The function $f : f(\theta) = \sin(b\,\theta)$ is a periodic function and its period $\left(\frac{2\pi}{3}\right)$, then b = ...

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) 3 (d) 6

10 **In the opposite figure :**

If $\overline{DE} // \overline{BC}$, $\overline{EF} // \overline{AB}$, $\frac{AD}{DB} = \frac{2}{3}$, then $\frac{\text{area}(\square DBFE)}{\text{area}(\Delta ABC)}$ = ...



(a) $\frac{21}{25}$ (b) $\frac{16}{25}$

(c) $\frac{12}{25}$ (d) $\frac{13}{25}$

11 If $4\mathcal{X} + 2\,y\,i = 8 + 4\mathcal{X}\,i$, then $\mathcal{X} + y$ = ...

(a) – 2 (b) 5 (c) 6 (d) 4

12 If $\mathcal{X} = 4$ is one of the roots of the equation $\mathcal{X}^2 + m\mathcal{X} = 4$, then .....

(a) m = – 3 (b) m is an even.

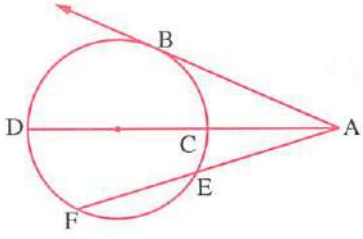
(c) (1 – m) is a perfect square. (d) (a) , (c) are true.

13 The sum of integers belong to the solution set of the inequality $(\mathcal{X} - 2)(3\mathcal{X} - 1) \leq 0$ equal .....

(a) – 1 (b) 1 (c) 2 (d) 3

14 **In the opposite figure :**

All the following mathematical expressions are true except .....

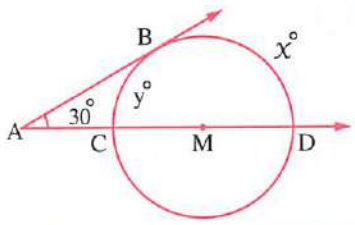


(a) $(AB)^2 = AC \times AD$ (b) $(AB)^2 = AE \times AF$

(c) $AC \times AD = AE \times AF$ (d) $AC \times CD = AE \times EF$

15 **In the opposite figure :**

$x^2 - y^2 =$ .....

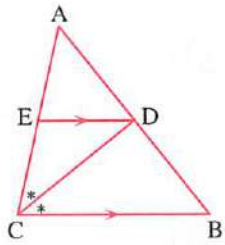


(a) 30×180 (b) 180×60

(c) 60 (d) 150

16 **In the opposite figure :**

$\frac{AE}{EC} =$ .....

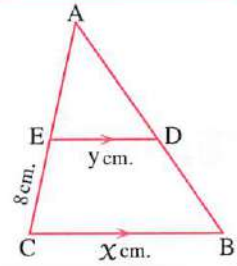


(a) $\frac{DE}{BC}$ (b) $\frac{AD}{AB}$

(c) $\frac{AC}{CB}$ (d) $\frac{AB}{BC}$

17 **In the opposite figure :**

If $\frac{x-y}{x+y} = \frac{2}{7}$, then AE = ... cm.



(a) 16 (b) 15

(c) 12 (d) 10

18 The diameter of circle M is 6 cm. , P_M (B) = zero , then B lies .....

(a) inside the circle. (b) outside the circle.

(c) on the circle. (d) at the centre of the circle.

19 If (L – 2) , (M – 2) are roots of the equation : $x^2 - 4x - 4 = 0$

, then $L^2 - 8L + 5 =$ .....

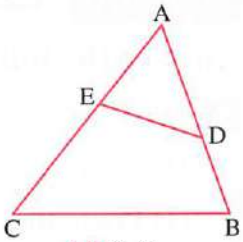
(a) 3 (b) – 3 (c) ± 3 (d) zero

20 **In the opposite figure :**

$\Delta ABC \sim \Delta AED$

If AD = 3 cm. , BD = 2 cm. , AE = 2.5 cm.

, then EC = ... cm.



(a) 2.5 (b) 3 (c) 4.5 (d) 3.5

21 The sum of the areas of two similar polygons is 225 cm^2 and the ratio between their perimeters 4 : 3 , then the area of the greater polygons. = ... cm^2

(a) 81 (b) 144 (c) $128\frac{4}{7}$ (d) $96\frac{3}{7}$

22 The function f where $f(x) = 2 - x$ is non-negative when $x \in$ .....

(a) $]-\infty , 2]$ (b) $]-\infty , 2[$ (c) $[2 , \infty[$ (d) $]2 , \infty[$

23 $\tan\left(-\frac{14}{3}\pi\right) =$ .....

(a) $-\sqrt{3}$ (b) $\sqrt{3}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{-1}{\sqrt{3}}$

24 If $P_M(A) = r$, then A lies ..... "where r is the radius length of the circle M"

(a) on the circle (b) outside the circle

(c) inside the circle (d) at the centre of the circle

25 If $\sin A = \frac{1}{2}$, then the least positive angle satisfies this trigonometric equation is .....

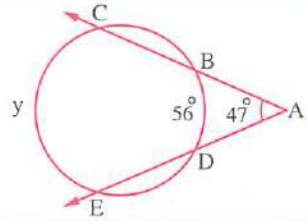
(a) 150° (b) 30° (c) 60° (d) 330°

26 In the opposite figure :

y = ...

(a) 90° (b) 140°

(c) 150° (d) 160°



27 If L , M are the two roots of the equation : $x^2 - 7x + 3 = 0$, then $L^2 + M^2 =$ .....

(a) 7 (b) 43 (c) 58 (d) 79

28 The two roots of the equation : $x(x - 2) = 5$ are .....

(a) two complex and non real roots. (b) two equal real roots.

(c) two differant real roots. (d) 2 and zero.

Second Essay questions

Answer the following questions :

1 ABCD is a rectangle in which AB = 6 cm. , BC = 8 cm.

Draw $\overrightarrow{BE} \perp \overline{AC}$ to intersect $\overline{AC}$ at E , $\overline{AD}$ at F

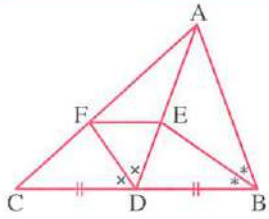
[1] Prove that : $(AB)^2 = AF \times AD$ **[2] Find :** The length of $\overline{AF}$

2 In the opposite figure :

In Δ ABC , D is a midpoint of $\overline{BC}$

, AB = AD , $\overrightarrow{BE}$ bisects $\angle$ B , $\overrightarrow{DF}$ bisects $\angle$ ADC

Prove that : $\overline{EF} // \overline{BC}$



3 **Find the general solution of the equation :** $\csc 6\theta = \sec 3\theta$

4 Prove that the roots of the equation : $7x^2 - 11x + 5 = 0$ are non real conjugate , then find these two roots by using the general formula.

5 ABC is a triangle , $D \in \overline{BC}$ where BD = 5 cm. and DC = 4 cm. If AC = 6 cm. , **prove that :**

[1] $\overline{AC}$ is a tangent segment to the circle passing through the points A , B and D

[2] $\Delta ACD \sim \Delta BCA$ [3] Area of (ΔABD) : Area of (ΔABC) = 5 : 9

Model 9

Interactive test 9

First Multiple choice questions

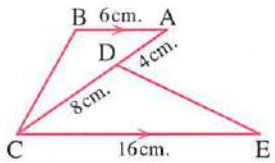
Choose the correct answer from the given ones :

1 The sign of the function f where $f(x) = 6 - 2x$ is positive if .....

(a) $x > 3$ (b) $x \geq 3$ (c) $x < 3$ (d) $x = 3$

2 **In the opposite figure :**

If $\overline{AB} // \overline{EC}$, then $\frac{ED}{BC}$ = ...



(a) $\frac{4}{3}$ (b) $\frac{3}{4}$

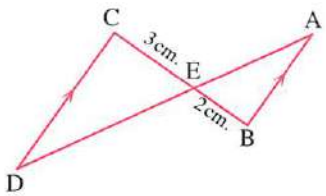
(c) $\frac{2}{3}$ (d) $\frac{1}{2}$

3 If $\cot(90° - \theta) = \cot 2\theta$ where $0° < \theta < 90°$, then $\sin 3\theta$ = ...

(a) – 1 (b) zero (c) 1 (d) $\frac{1}{2}$

4 **In the opposite figure :**

$\overline{AB} // \overline{CD}$, BE = 2 cm. , CE = 3 cm. , AD = 10 cm. , then AE = ... cm.

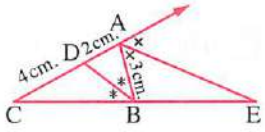


(a) 4 (b) 6

(c) 2 (d) 3

5 **In the opposite figure :**

BE = ... cm.



(a) 6 (b) 8

(c) 9 (d) 10

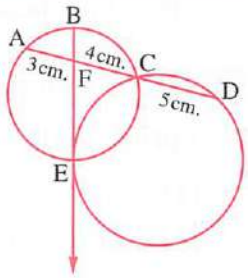
6 $\cos(90° - \theta) \times \csc\theta =$ .....

(a) zero (b) 1 (c) -1 (d) $\cot\theta$

7 **In the opposite figure :**

Two intersecting circles at C , E , $\overrightarrow{BE}$ touches the larger circle at E

If AF = 3 cm. , FC = 4 cm. , CD = 5 cm. , then BE = ... cm.



(a) 9 (b) 8

(c) 7 (d) 6

8 If the terminal side of an angle of measure 30° in standard position rotates three and half revolutions clockwise then the terminal side lies in the ..... quadrant.

(a) first (b) second (c) third (d) fourth

9 The number of intersections between the curve

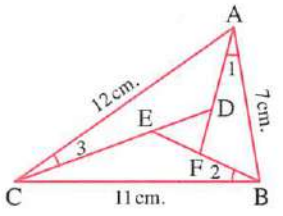
$y = \sin 3x$ with x-axis in the interval $[0 , 2\pi]$ equals .....

(a) 2 (b) 3 (c) 4 (d) 7

10 **In the opposite figure :**

If m ($\angle$ 1) = m ($\angle$ 2) = m ($\angle$ 3)

, then DE : EF : FD = ...

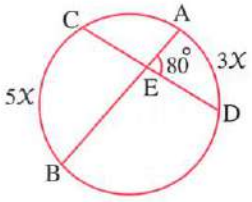


(a) 7 : 11 : 12 (b) 12 : 11 : 7

(c) 12 : 7 : 11 (d) 11 : 12 : 7

11 **In the opposite figure :**

x = ...



(a) 10° (b) 20°

(c) 30° (d) 40°

12 If $\sec 3\theta = 2$ where θ is an acute angle , then θ = ...

(a) 10° (b) 15° (c) 20° (d) 30°

13 The interior bisector at a vertex of a triangle ..... the exterior bisector at this vertex.

(a) parallel (b) perpendicular to

(c) equal (d) coincide with

14 If L , M are the two roots of the equation : $\mathcal{X}^2 - 5\,\mathcal{X} - 6 = 0$

the numerical value of the expression : $L^2 - 5\,L + 3 =$ .....

(a) -6 (b) 6 (c) 9 (d) 3

15 Two similar polygons are congruent if their scale factor of similarity equals .....

(a) $\frac{1}{2}$ (b) 1 (c) more than 1 (d) less than 1

16 If $a\,\mathcal{X}^2 + b\,\mathcal{X} + c = 0$, a , b and c are real numbers and $(b^2 - 4\,a\,c)$

is not positive , then the roots of the equation are .....

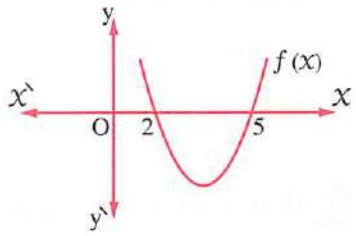
(a) equal. (b) not real.

(c) conjugate complex. (d) real different.

17 **In the opposite figure :**

$f(\mathcal{X}) = a\,\mathcal{X}^2 + b\,\mathcal{X} + c$

, then $\frac{b + c}{a} =$ .....



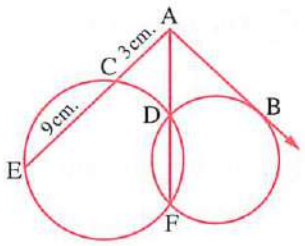
(a) 3 (b) 5

(c) 7 (d) 10

18 **In the opposite figure :**

If AC = 3 cm. , CE = 9 cm.

, then AB = ... cm.



(a) 27 (b) 36

(c) 9 (d) 6

19 The simplest form of the imaginary number $i^{-18} =$ .....

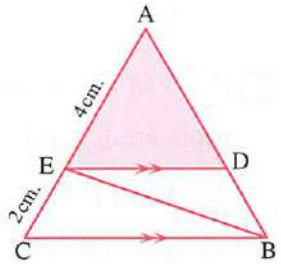
(a) 1 (b) -1 (c) $-i$ (d) i

20 **In the opposite figure :**

If $\overline{DE}$ // $\overline{BC}$ and the area

of (Δ EBC) = 9 cm^2

, then the area of (Δ ADE) = ... cm^2



(a) 6 (b) 12

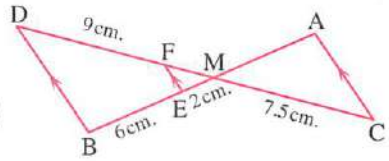
(c) 18 (d) 27

21 The measure of an inscribed angle is 60° subtended by an arc of length 4 π cm. , then the circumference of the circle = ... cm.

(a) 24 π (b) 12 π (c) 6 π (d) 18 π

22 In the opposite figure :

MF + AM = ... cm.

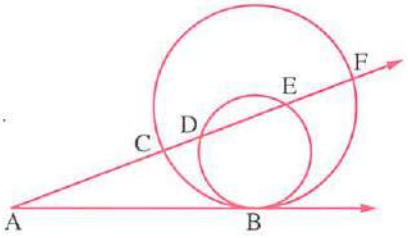


(a) 11 (b) 7.5

(c) 6 (d) 8

23 In the opposite figure :

$\overrightarrow{AB}$ is a common tangent to the two circles at B and $\overrightarrow{AF}$ is a secant to both of then , then $(AB)^2$ = ...



(a) AC × CD (b) AD × AE

(a) AD × DF (d) AC × CF

24 If the roots of the equation : $4x^2 - 12x + m = 0$ are equal , then m = ...

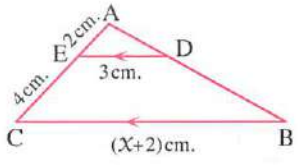
(a) 3 (b) 4 (c) 9 (d) 16

25 The sign of $f : f(x) = -2x$ is positive in the interval .....

(a) $]-\infty , \infty[$ (b) $\mathbb{R} - \{2\}$ (c) $]-\infty , 2]$ (d) $]-\infty , 0[$

26 In the opposite figure :

x = ...



(a) 5 (b) 6

(c) 7 (d) 8

27 If L , M are the two roots of the equation : $x^2 + x + 1 = 0$, then L + M + LM = ...

(a) zero (b) 1 (c) – 1 (d) 2

28 If L , M are the two roots of the equation : $x^2 - 5x + 7 = 0$, then the equation whose two roots are L^2 and M^2 is .....

(a) $x^2 + 11x + 49 = 0$ (b) $x^2 - 11x + 49 = 0$

(c) $x^2 - 49x + 11 = 0$ (d) $x^2 + 11x - 49 = 0$

Second Essay questions

Answer the following questions :

1 Without using calculator find the value of the following :

$\sin 420° \cos 330° + \frac{\sin 15°}{\sin 165°} + \tan^2 65° - \cot 25° \tan 65°$

2 ABC is a triangle inscribed in a circle , D is a midpoint of $\overline{BC}$, draw $\overrightarrow{AD}$ to intersect the circle at E

Prove that : [1] $(BD)^2 = AD \times DE$ [2] $\Delta EBD \sim \Delta CAD$

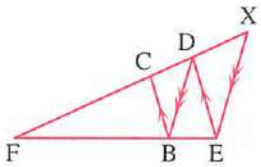
3 The perimeter of triangle ABC is 27 cm. , draw $\overrightarrow{BD}$ bisects $\angle B$ and intersect $\overline{AC}$ at D , if AD = 4 cm. , CD = 5 cm. **Find the length of each :** $\overline{AB}$, $\overline{BC}$, $\overline{BD}$

4 If $X = 2 + 3i$, $y = \frac{3+i}{i}$ find the value of the expression : $X^2 + 2Xy + y^2$

5 **In the opposite figure :**

$\overline{ED} // \overline{BC}$, $\overline{DB} // \overline{EX}$

Prove that : $\left(\frac{FB}{FE}\right)^2 = \frac{FC}{FX}$



Model 10

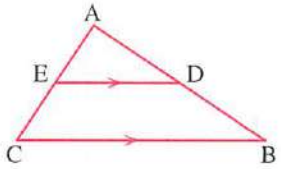
Interactive test 10

First Multiple choice questions

Choose the correct answer from the given ones :

1 **In the opposite figure :**

All the following mathematical expressions are true except .....



(a) $\frac{AD}{DB} = \frac{AE}{EC}$ (b) $\frac{AD}{DB} = \frac{DE}{BC}$

(c) $\frac{AD}{AB} = \frac{AE}{AC}$ (d) $\frac{AB}{BD} = \frac{AC}{EC}$

2 If $\sin \propto = \cos \beta$ where $\propto$, β are two acute angles , then $\tan(\propto + \beta)$ = ...

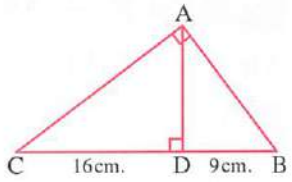
(a) $\frac{1}{\sqrt{3}}$ (b) 1 (c) $\sqrt{3}$ (d) undefined.

3 The smallest value of the function f , where $f(\theta) = 3 \cos(2\theta)$ is .....

(a) – 6 (b) – 3 (c) – 2 (d) – 1

4 **In the opposite figure :**

The length of $\overline{AB}$ = ... cm.



(a) 12 (b) 15

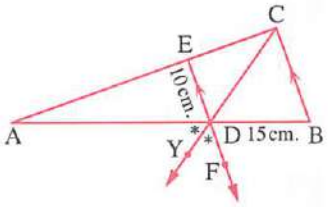
(c) 20 (d) 25

5 **In the opposite figure :**

If $\overline{ED} // \overline{BC}$, m ($\angle$ ADY) = m ($\angle$ FDY)

and ED = 10 cm. , BD = 15 cm.

, then AD = ... cm.



(a) 20 (b) 25 (c) 30 (d) 45

6 The equation whose roots are (2 + 3 i) , (2 – 3 i) is .....

(a) $x^2 + 4x + 13 = 0$ (b) $x^2 - 4x + 13 = 0$

(c) $x^2 + 4x - 13 = 0$ (d) $x^2 - 4x - 13 = 0$

7 $(1 - i)^{12}$ = ...

(a) – 64 i (b) 64 i (c) – 64 (d) 64

8 If the scale factor of similarity of the polygon P_1 to the polygon P_2 is $\frac{2}{3}$ and scale factor of similarity of the polygon P_3 to the polygon P_2 is $\frac{1}{3}$, which of the following relations is correct ?

(a) Area (P_1) + Area (P_2) = Area (P_3)

(b) Area (P_1) + Area (P_3) = Area (P_2)

(c) $\sqrt{\text{Area }(P_1)} + \sqrt{\text{Area }(P_2)} = \sqrt{\text{Area }(P_3)}$

(d) $\sqrt{\text{Area }(P_1)} + \sqrt{\text{Area }(P_3)} = \sqrt{\text{Area }(P_2)}$

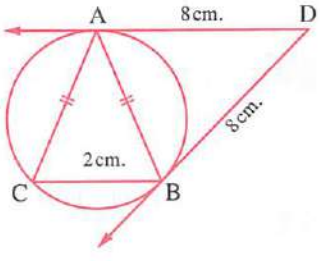
9 **In the opposite figure :**

If $\overrightarrow{DA}$, $\overrightarrow{DB}$ are tangents to

the circle at A and B respectively

, DA = DB = 8 cm. , BC = 2 cm.

, then AC = ... cm.

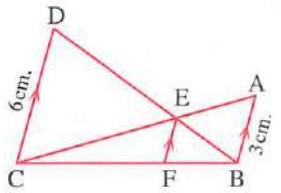


(a) 3 (b) 4 (c) 5 (d) 6

10 **In the opposite figure :**

If $\overline{AB} // \overline{EF} // \overline{CD}$

, then EF = ... cm.

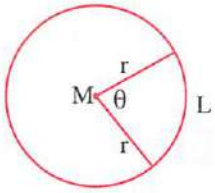


(a) 2.5 (b) 2

(c) 1.5 (d) 1

11 **In the opposite figure :**

θ^{rad} = ...

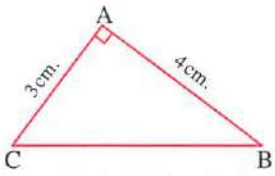


(a) $\frac{L}{r}$ (b) $\frac{r}{L}$

(c) $r \times L$ (d) $L \times 2r$

12 **In the opposite figure :**

m ($\angle$ ABC) = ...

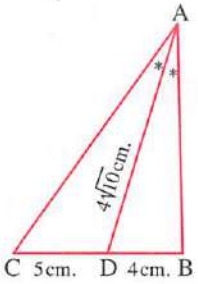


(a) $\sin^{-1}\left(\frac{3}{4}\right)$ (b) $\sin^{-1}\left(\frac{4}{3}\right)$

(c) $\tan^{-1}\left(\frac{3}{4}\right)$ (d) $\cot^{-1}\left(\frac{3}{4}\right)$

13 **In the opposite figure :**

The perimeter of Δ ABC = ... cm.



(a) 36

(b) 32

(c) 28

(d) 24

14 The roots of the equation : $x^2 - 2\sqrt{5}x + 1 = 0$ are .....

(a) rational real. (b) not real.

(c) real equal. (d) irrational real.

15 The sign of the function f : $f(x) = x - 4$ where $x \in]4 , \infty[$ is .....

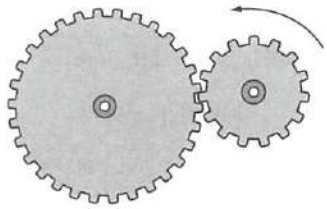
(a) always positive.

(b) always negative.

(c) positive in the interval $]4 , 5[$ and negative in the interval $]5 , \infty[$

(d) negative in the interval $]4 , 5[$ and positive in the interval $]5 , \infty[$

16 **In the opposite figure :**



If the greater gear revolves one revolution

, then the smaller gear revolves 3 revolution

If the smaller gear revolves one revolution

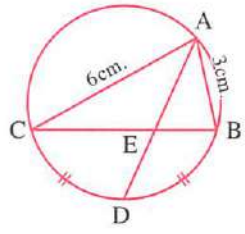
in the direction of the arrow shown on the figure

, then the central angle of revolving the greater gear is .....

(a) $-\frac{\pi}{2}$ (b) $\frac{-2\pi}{3}$ (c) $\frac{2\pi}{3}$ (d) 2π

17 **In the opposite figure :**

$\frac{BE}{BC}$ = ...



(a) $\frac{1}{3}$ (b) $\frac{1}{2}$

(c) $\frac{2}{3}$ (d) $\frac{3}{2}$

18 The ratio between the length of two corresponding sides of two similar triangles is 1 : 4

, then the ratio between their areas is .....

(a) 1 : 2 (b) 1 : 4 (c) 1 : 8 (d) 1 : 16

19 If $L \in \mathbb{R}$, $M \in \mathbb{R}$ are the two roots of the equation : $a x^2 + b x + c = 0$ where $a > 0$, $L < M$

, then the solution set of the inequality : $a x^2 + b x + c < 0$ is .....

(a) $]-\infty , L[$ (b) $]L , M[$ (c) $]M , \infty[$ (d) $\mathbb{R} - [L , M]$

20 If one of the roots of the equation : $4k x^2 + 7x + k^2 + 4 = 0$ is multiplicative inverse of the other root , then k = ...

(a) ± 2 (b) 3 (c) 4 (d) 2

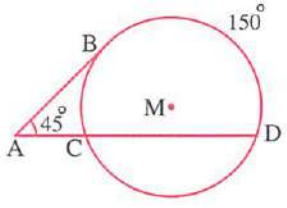
21 **In the opposite figure :**

$\overline{AB}$ is a tangent segment to circle M at B

, $\overrightarrow{AC}$ intersects the circle at C , D

, $m(\angle A) = 45°$, $m(\overset{\frown}{DB}) = 150°$

, then $m(\overset{\frown}{BC})$ = ...



(a) 30° (b) 40° (c) 60° (d) 120°

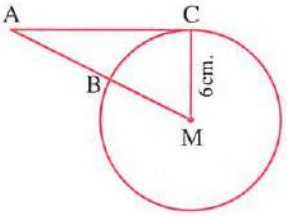
22 In ΔABC , $AB = 8$ cm. , $AC = 6$ cm. , $D \in \overline{AB}$ such that $AD = 3$ cm. , $E \in \overline{AC}$ such that $AE = 4$ cm. If the area of $\Delta AED = 3$ cm^2 , then the area of the polygon DBCE = ... cm^2

(a) 12 (b) 9 (c) 6 (d) 8

23 **In the opposite figure :**

$\overline{AC}$ touches the circle M at C , $MC = 6$ cm.

, $P_M(A) = 64$, then AB = ... cm.



(a) 3 (b) 4

(c) 5 (d) 6

24 If $\Delta ABC \sim \Delta XYZ$ and $3\,AB = 2\,XY$, then area of ΔABC : area of ΔXYZ = ...

(a) 4 : 9 (b) 9 : 4 (c) 2 : 3 (d) 3 : 2

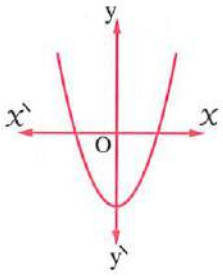
25 The angle of measure $\left(\frac{7\pi}{6}\right)$ radian has degree measure = ...

(a) 225° (b) 210° (c) 840° (d) – 225°

26 $(1 + i)^{10}$ = ...

(a) 32 i (b) – 32 i (c) 32 (d) – 32

27 The opposite figure represents the curve of the function $f : f(x) = a x^2 + b x + c$, then which of the following is true ?



(a) $a > 0$, $c > 0$ (b) $a > 0$, $c < 0$

(c) $a < 0$, $b > 0$ (d) $a < 0$, $c < 0$

28 If one of the two roots of the equation : $x^2 + k x - 98 = 0$ is twice the additive inverse of the other root , then k = ...

(a) ± 14 (b) ± 7 (c) ± 8 (d) 49

Second Essay questions

Answer the following questions :

1 **In the opposite figure :**

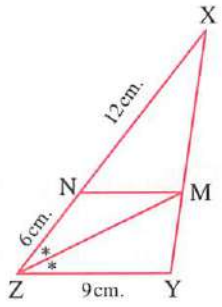
XN = 12 cm.

, NZ = 6 cm.

, YZ = 9 cm.

, $\overrightarrow{ZM}$ bisects ∠ XZY

Prove that : $\overline{MN}$ // $\overline{YZ}$



2 If $5 \sin\theta - 3 = 0$, $\frac{\pi}{2} < \theta < \pi$

Find the value of : $\cos\left(\frac{\pi}{2} - \theta\right) + \sin(2\pi - \theta) - \cos\left(\frac{3\pi}{2} - \theta\right) + \cos\theta$

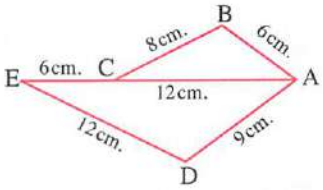
3 **In the opposite figure :**

AB = 6 cm. , BC = 8 cm. , AC = 12 cm.

, CE = 6 cm. , AD = 9 cm. , DE = 12 cm.

Prove that :

[1] Δ ABC ~ Δ ADE [2] $\overrightarrow{AE}$ bisects ∠ BAD



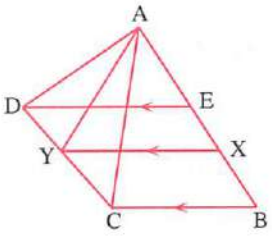
4 Represent graphically the function $f : f(x) = x^2 - 2x - 3$, then determine the sign of the function.

5 **In the opposite figure :**

$\overline{ED}$ // $\overline{XY}$ // $\overline{BC}$

and AD × BX = AC × EX

Prove that : $\overrightarrow{AY}$ bisects ∠ CAD



كيفية طباعة صفحات معينة من ملف معين

مثلا ازاى نطبع الصفحات من صفحة 4 الى صفحة 9

